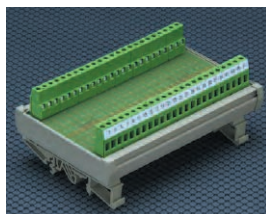


CONNECTOR TO TERMINAL BLOCK MODULES

Compact and reliable connections between high density connectors and high quality screw-cage clamp terminal blocks; DIN Rail mountable

Page6-7



DIODE MODULES & COMPONENT CARRIERS

Add additional components to build circuits and diode modules mounted on 35 or 32mm DIN Rails.

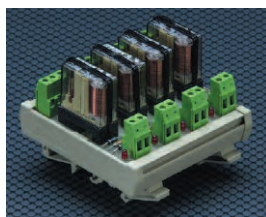
Page8-10



MONITORING PROTECTION MODULES

Special purpose components connected to screw-cage clamp terminal blocks; DIN Rail mountable.

Page11



RELAY MODULES

Traditional relay modules from 1-16 channels. Available in several voltages (AC & DC), isolated or bussed systems. DIN Rail mounted.

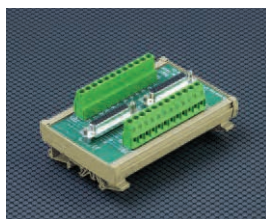
Page12-17



SAFETY RELAY MODULES

Force-guided contact modules available in 1-16 channels, 12 and 24VDC coils and isolated or bussed systems. All mountable on 32 or 35mm DIN Rails.

Page18-25



CUSTOM MODULES

Altech provides quick turn-key custom designs and competitive solutions.

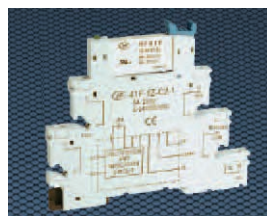
Page26



GENERAL PURPOSE/INTERFACE RELAYS

A selection of DIN Rail mountable general purpose relays available for up to 12 A @ 250 Volts.

Page27-29



PLUGGABLE SLIMLINE RELAYS

Need Text

Page30-31



I/O MODULE CARRIERS

Accepts industry standard I/O modules. LED indicator and fuse protection included on carrier.

Page32-33



SOLID STATE I/O MODULES

Input/Output Modules (both AC and DC) provided on a DIN mountable module. Bussed and isolated versions available.

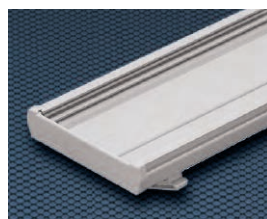
Page34-35



POWER SUPPLIES

Basic and High Performance Series. DIN Rail mountable units are available with 12 or 24VDC output, 15 to 60 Watts and regulated outputs.

Page36-42



MOUNTING TRACKS

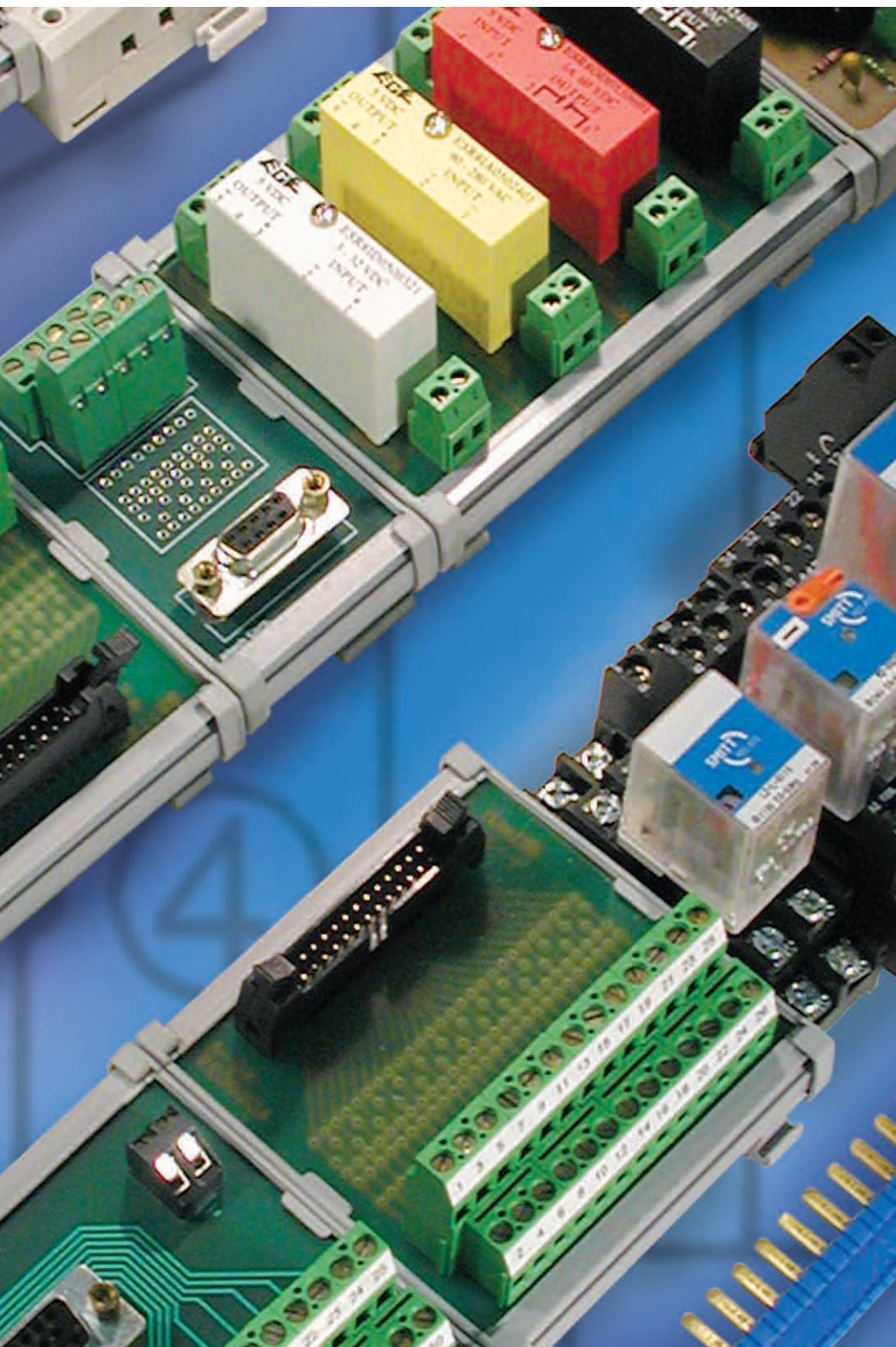
DIN Rail or panel mount mounting tracks secure standard or custom printed circuit boards in control panels or cabinets.

Page44-45

Intro4-5

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Terms and Conditions50



Link incompatible hardware or expand the capabilities of logic systems with Altech interface and electronic modules and carriers. These DIN Rail or panel mounted printed circuit board modules, subsystems and carriers give design flexibility, simplify panel layouts and reduce maintenance and downtime.

Altech's compact interface modules provide a flexible, cost effective transition from Sub-D, Ribbon Cable and other connectors to terminal blocks.

Altech's electronic modules include Diode, Fuse, Varistor, Optocoupler (I/O), Relay, power supplies and custom modules.

If your needs go beyond our comprehensive range of standard interface and electronic modules, Altech can custom design a module to meet even the most sophisticated requirements.

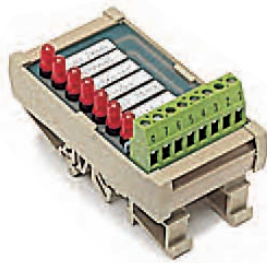
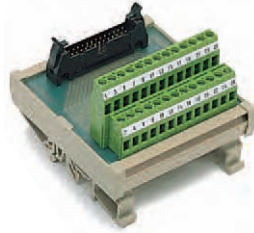
Modules are supplied completely assembled with ready to wire screw-cage terminal blocks in an extruded track. The track can be mounted on 35 or 32mm DIN Rail or can be panel mounted. Select individual components and mount your own electronic boards with Altech mounting tracks.

MODULES

CONNECTOR-TO-TERMINAL BLOCK

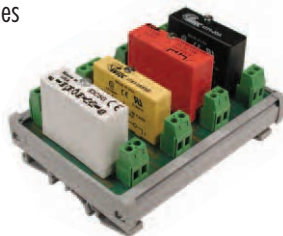
Compact and reliable transitions between high density connectors and high quality screw-cage clamp terminal blocks.

- FBK Ribbon Cable, up to 64 poles
- Subminiature - D, up to 50 poles



DIGITAL I/O MODULES

- DIN Mount Solid State I/O Modules or carriers only
- Accommodates either input or output modules
- DIN Rail or Panel Mount
- Built-in Fuses, LED Indicator
- Bussed or Isolated configurations



CUSTOM INTERFACE MODULES

If your design or application requires more functionality or features than our standard product, Altech offers complete engineering, prototype and production services for custom modules.

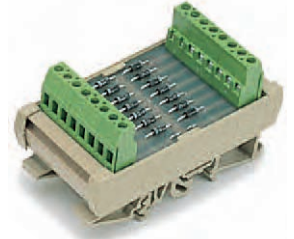
Our staff has the ability to take your design or requirements and manufacture your custom module. Custom module production generally includes engineering, PCB layout and prototypes, packaged in Altech extrusions for mounting on panels or DIN Rail. In many industrial control systems, customized designs are the solution for many problems.

Altech provides a quick turnaround and competitive solution to your problem.

DIODE MODULES & COMPONENT CARRIERS

Use our Diode Modules to build lamp test circuits, decouple signals, etc. Mount your own components into our Component Carriers (supplied without electronic components). Or, tell us what you need and we'll install it for you.

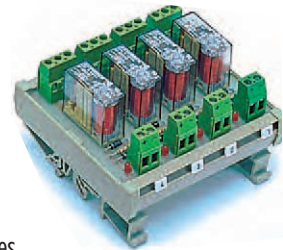
- DM Diode Modules have series connection 1A or 3A diodes, and 1A diode gates with common cathodes or anodes, providing commonly used diode arrangements
- BSM Component Carrier has factory installed fork-and eyelet soldering posts in each series trace
- CCA Component Carrier consists of a printed circuit board with four in-line and two bus-connection through-holes to solder pads in each trace, complete with terminal blocks



MINIATURE RELAYS

Traditional relay and safety relay modules in a high density package.

- Protect equipment
- Provide insulation
- Control motors, solenoid and valves
- Safety relays for emergency stop, safety gate and two-hand stop



POWER SUPPLIES

- No Ground circuit contamination
- 4 Models available
- DIN Rail or Panel Mount
- Developed to meet US Government Guidelines

Application Assistance

Modify a standard product
Help define a new product

Engineering Capability

Use of latest CAD system
PCB layouts completed promptly
Prototypes available two weeks after
PCB layout approval

Manufacturing Capability

Complete in-house manufacturing
ISO 9001 Certified

Minimum Quantities

25 piece minimum for custom quotes
Quotation provided at no cost

Altech Benefits

Fast turnaround due to in-house capability
Highly competitive in-house manufacturing
Use of Altech components (blocks, extrusions, connectors)



INTERFACES

CONNECTOR-TO-WIRE

Subminiature D Module

35 or 32mm DIN Rail

Compact Subminiature D (Sub D) Modules provide quick and reliable interfaces between high density connectors (back shells) with up to 50 poles and discrete wires. Connector-to-Wire Interface modules save time and eliminate wiring mistakes. No special tools are required. Sub D Interface modules are typically used in communications, data processing, process control and other industrial applications.

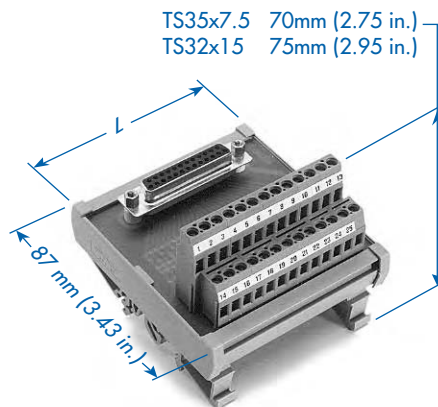
Keyed by design, Sub D Modules are equipped with male or female connectors, screw-cage clamp terminal blocks, and component solder pads for easy insertion of circuit building components. All terminal blocks are individually marked to correspond to the numbers on the connector pins or sockets.

- Screw-Cage Clamp Connections
- 4 to 5 Component Solder Pads Per Line^a
- .9mm (.035 in.) Component Mtg. Holes
- DIN Rail Mount, Panel Mount Available

Ordering Information	No. of Poles
Sub D, Female Connector	9
	15
	25
	37
	50
Sub D, Male Connector	9
	15
	25
	37
	50

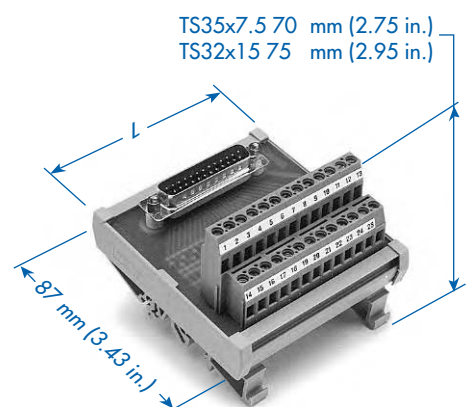
SD

Female Sub D



SD

Male Sub D

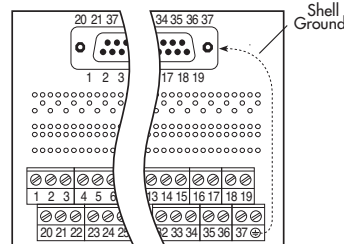


Wire Range	Current	Voltage
0.5-4mm ²		
22-12 AWG	4A	250VAC

Type	Cat. No.	Module Length (L) mm (in.)	Std. Pk.
SD-F9	5745.2	45 (1.77)	1
SD-F15	5746.2	48 (1.89)	1
SD-F25	5747.2	81 (3.19)	1
SD-F37	5748.2	114 (4.49)	1
SD-F50	5749.2	137 (5.39)	1

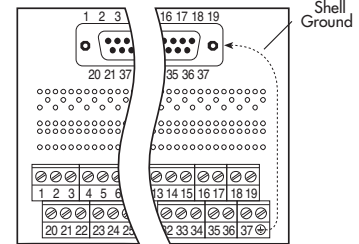
Wire Range	Current	Voltage
0.5-4mm ²		
22-12 AWG	4A	250VAC

Type	Cat. No.	Module Length (L) mm (in.)	Std. Pk.
SD-M9	5740.2	45 (1.77)	1
SD-M15	5741.2	48 (1.89)	1
SD-M25	5742.2	81 (3.19)	1
SD-M37	5743.2	114 (4.49)	1
SD-M50 ^b	5744.2	137 (5.39)	1



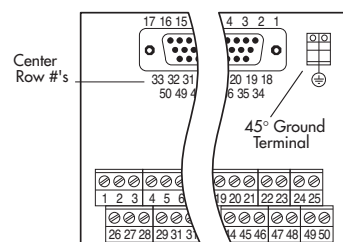
Female Connector SD-F37

37 Pin Socket Female Connector Shown with component counting holes (pads are on solder side)



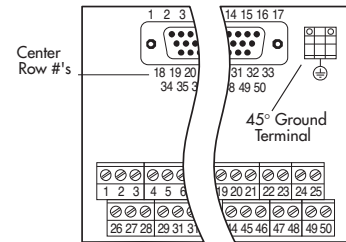
Male Connector SD-M37

37 Pin Male Connector Shown with component mounting holes (pads are on solder side)



Female Connector SD-F50

50 Pin Socket Female Connector Shown with no component solder pads



Male Connector SD-M50

50 Pin Male Connector Shown with no component solder pads

^a SD-F50 and SD-M50 are double-sided boards and do not have component solder pads.

^b SD-M50 is only available with a 1.5A current rating.

INTERFACES

CONNECTOR-TO-WIRE

Ribbon Cable Module

35 or 32mm DIN Rail

Compact Ribbon Connector Modules provide an interface between multi-wire flat cables outfitted with IDC connectors and discrete wires. Up to 64 conductors can be terminated saving time and eliminating wiring mistakes.

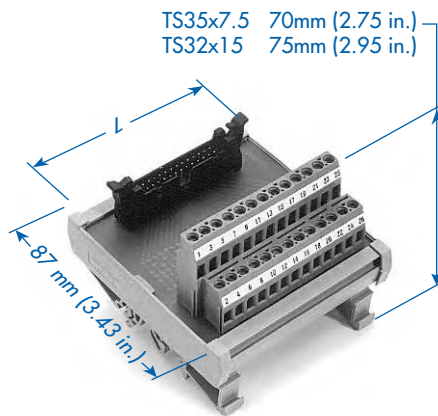
No special wiring or tools are required. Ribbon Cable Interface Modules are typically used in communications, data processing, process control and other industrial applications.

FBK Ribbon Cable Modules are supplied with short strain relief ejector latches (long ejector latches are available), screw-cage clamp terminal blocks and component solder pads for easy insertion of circuit building components. All terminal blocks are individually marked to correspond to the numbers on the header pins.

- Screw-Cage Clamp Connections
- Up to 64 Poles
- 4 to 5 Component Solder Pads Per Line
- .9mm (.035 in.) Component Mtg. Holes
- DIN Rail Mount, Panel Mount Available

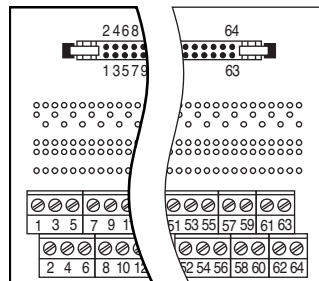
FBK

Ribbon Cable



Wire Range	Current	Voltage
0.5-4mm ²		
22-12 AWG	3A	250V AC

Ordering Information	No. of Poles	Type	Cat. No.	Module Length (L) mm (in.)	Std. Pk.
Ribbon Cable Module with Short Ejector Latches	10	FBK10	5720.2	47 (1.85)	1
	14	FBK14	5721.2	47 (1.85)	1
To order long ejector latches, specify Cat. No. with /L suffix. Example: Cat. No. 5727.2/L.	16	FBK16	5722.2	69 (2.72)	1
	20	FBK20	5723.2	69 (2.72)	1
	26	FBK26	5724.2	80 (3.15)	1
	34	FBK34	5725.2	103 (4.06)	1
	40	FBK40	5726.2	114 (4.49)	1
	50	FBK50	5727.2	148 (5.83)	1
	60	FBK60	5728.2	170 (6.68)	1
	64	FBK64	5729.2	170 (6.68)	1



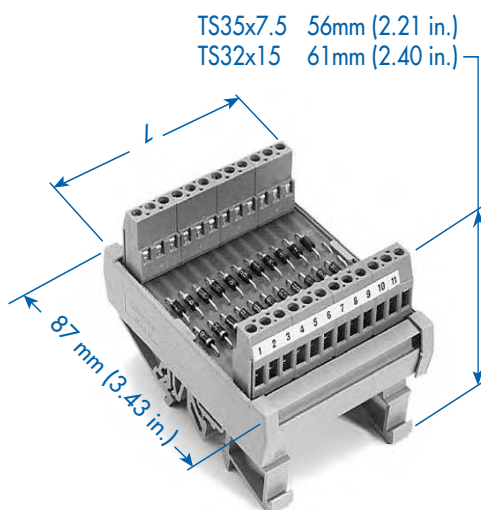
Model FBK64

INTERFACES**Diode Module****35 or 32mm DIN Rail Mount**

Wire individually labeled diodes into existing circuits for freewheeling, DC inductive kick suppression (commutating), reverse DC polarity protection, etc. Use bussed diodes for distribution of logic Vcc or ground, or gather and decouple electrical signals for lamp testing or collective fault messages. Use as commutating diodes across inductive loads such as DC relays, solenoid valves, actuator magnets, etc. to suppress voltage surges.

Standard modules include series connection diode circuits in 1 Amp and 3 Amp versions, and diode gates with bussed anodes or cathodes.

- Screw-Cage Clamp Connections
- Special Configurations Available
- DIN Rail Mount, Panel Mount Available

DM
Diode Module
**Specifications:**

Diode: 1N4007 or equivalent
Rated Current: 1A

Diode: 1N5408 or equivalent
Rated Current: 3A

Maximum Blocking Voltage - 1000V DC

Rated Bus Current: 10A
(12A at 30°C (86°F) Temperature Rise)

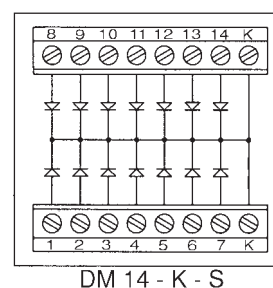
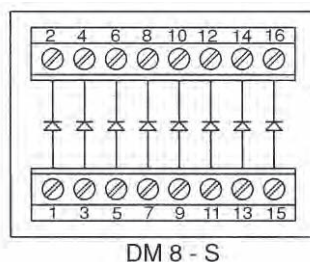
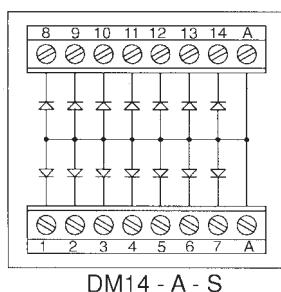
Wire Range

0.5-4mm²
22-12 AWG

Voltage

250V

Ordering Information	No. of Diodes	Diode	Type	Cat. No.	Module Length (L) mm (in.)	Std. Pk.
Series Connection, 1A diodes	4	1N4007	DM4-S	8971.2	24 (0.95)	1
Series Connection, 1A diodes	8	1N4007	DM8-S	5702.2	44 (1.73)	1
Series Connection, 1A diodes	12	1N4007	DM12-S	5703.2	64 (2.52)	1
Series Connection, 1A diodes	16	1N4007	DM16-S	8973.2	92 (3.62)	1
Series Connection, 1A diodes	20	1N4007	DM20-S	8974.2	112 (4.41)	1
Series Connection, 1A diodes	24	1N4007	DM24-S	8975.2	132 (5.20)	1
Series Connection, 3A diodes	4	1N5408	DM4-S3	8971.3	24 (0.95)	1
Series Connection, 3A diodes	8	1N5408	DM8-S3	5702.3	44 (1.73)	1
Series Connection, 3A diodes	12	1N5408	DM12-S3	5703.3	64 (2.52)	1
Series Connection, 3A diodes	16	1N5408	DM16-S3	8973.3	92 (3.62)	1
Series Connection, 3A diodes	20	1N5408	DM20-S3	8974.3	112 (4.41)	1
Series Connection, 3A diodes	24	1N5408	DM24-S3	8975.3	132 (5.20)	1
Bussed Anodes, 1A diodes	6	1N4007	DM6-A-S	8842.2	30 (1.18)	1
Bussed Anodes, 1A diodes	14	1N4007	DM14-A-S	5704.2	50 (1.97)	1
Bussed Anodes, 1A diodes	22	1N4007	DM22-A-S	5705.2	70 (2.75)	1
Bussed Cathodes, 1A diodes	6	1N4007	DM6-K-S	8850.2	30 (1.18)	1
Bussed Cathodes, 1A diodes	14	1N4007	DM14-K-S	5706.2	50 (1.97)	1
Bussed Cathodes, 1A diodes	22	1N4007	DM22-K-S	5707.2	70 (2.75)	1



INTERFACES

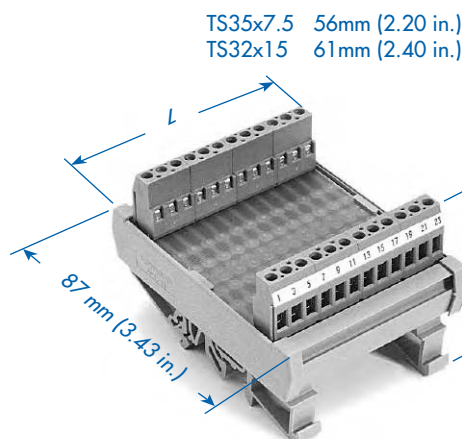
Component Carriers

35 or 32mm DIN Rail

Use Component Carriers to modify and/or build circuits to meet special requirements. Type CCA requires removal of the single solder-side printed circuit board from the mounting track for soldering of components. Posts or through-leads can be installed for future field connections. Contact Altech for custom installation of solder posts.

Type BSM allows field additions of diodes for decoupling, line crossovers for testing or multiplying tie-in terminals for a line. Pre-installed flat, fork-and-eyelet soldering posts allow component-side mechanical and solder connections with minimum disruption to wiring and mounted devices.

- Screw-Cage Clamp Connections
- Terminal Blocks are Numbered for Easy Wire Identification
- DIN Rail Mount, Panel Mount Available

CCA
Component Carrier

Wire Range	Current/Line	Voltage
0.5-4mm ²	6A	250V
22-12 AWG	(12A Bus ^a)	

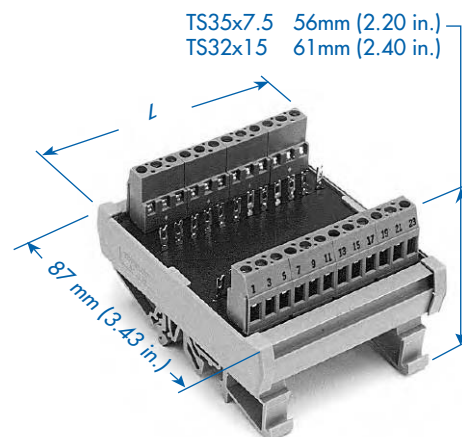
Ordering Information	No. of Poles	Type	Cat. No.	Module Length (L) mm (in.)
Component Carrier	4	CCA4	8835.2	24 (.87)
without solder posts	8	CCA8	8836.2	44 (1.65)
	12	CCA12	8837.2	64 (2.44)
	16	CCA16	8838.2	84 (3.23)
	20	CCA20	8839.2	104 (4.02)
	24	CCA24	8840.2	124 (4.80)

Component Carrier
with fork-and-eyelet solder posts

8 Channel 16

12 Channel 24

Std. Pk.: 1

BSM
Component Carrier

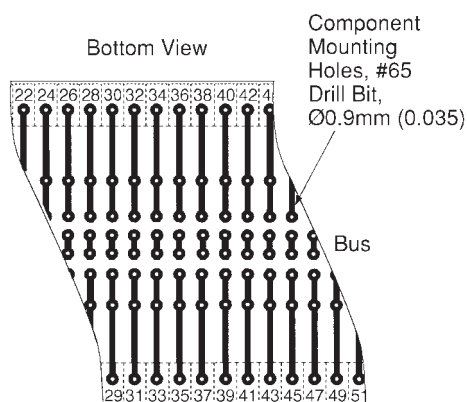
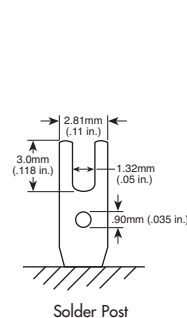
Wire Range	Current/Channel	Voltage
0.5-4mm ²	5A	250V
26-14 AWG		

Type	Cat. No.	Module Length (L) mm (in.)
BSM8-S	5700.2	47 (1.85)
BSM12-S	5701.2	69 (2.72)

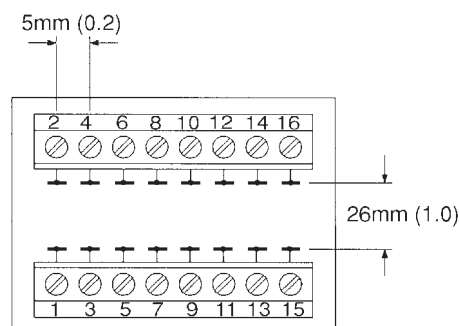
BSM8-S 5700.2 47 (1.85)

BSM12-S 5701.2 69 (2.72)

Std. Pk.: 1



CCA Type



BSM Type

^a Printed Circuit Board Trace Rating.

Series Trace: 6A

Bus Trace: 12A

Terminal Block Rating: 15A

INTERFACES

Dip Socket Carrier - 3 Amp 35 or 32mm DIN Rail Mount

Enhance design capabilities with Dual In-Line Package (DIP) Socket Carriers, the most versatile socket available. Use our DIPC's for reed-relays, power relays, photo-isolated Input/Output modules, in-line switches, thin film resistors and more. The Altech DIPC is rated 3 Amp and is available in 14, 16 and 20 pin socket configurations. Each DIPC module has several component solder pads for loading circuit-building components.

- Screw-Cage Clamp Connections
- 4 to 5 Component Solder Pads Per Line
- .9mm (.035 in.) Component Mtg. Holes
- DIN Rail Mount, Panel Mount Available

Typical Applications:

14 Pin

Magnecraft® Classes 107, 171, 172;
S-D® Series MRR-D; Hamlin® 700;
Dale® TDP14 Resistors; etc.

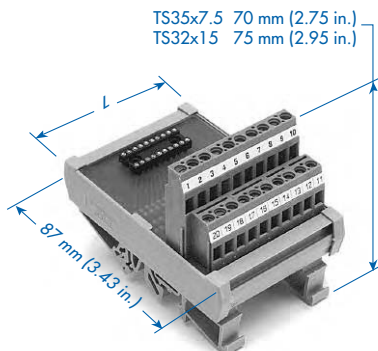
16 Pin

Most P&B® including T85 Hi Sens and
I/O Modules IA, OA, OD16;
Midtex® 190 Power;
Augat® Alcoswitch® GD, AD Series, etc.

20 Pin

C&K® BD series switches;
Grayhill® 79 coded switches;
AMP® 7600 shunts; etc.

DIPC Dip Socket Carrier



Wire Range	Current	Voltage
0.5-4mm ²		
22-12 AWG	3A*	250V

Ordering Information

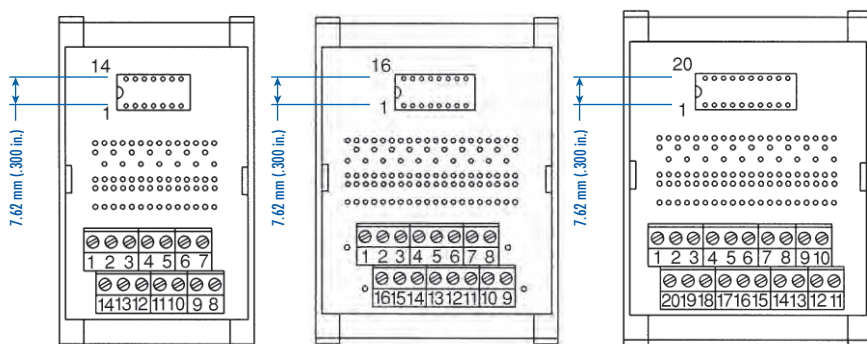
DIP Socket Carrier, 14 Pin

DIP Socket Carrier, 16 Pin

DIP Socket Carrier, 20 Pin

Type	Module Length	
	Cat. No.	(L) mm (in.)
DIPC14	8937.2	45 (1.77)
DIPC16	8938.2	56 (2.20)
DIPC20	8939.2	56 (2.20)

Std. Pk.: 1



* Current Ratings

Printed Circuit Traces: 3.5A

Terminal Blocks: 15A

Dip Socket: 3A

Voltage Regulator

Altech's voltage regulator modules provide a well-regulated output voltage from an unregulated source. Each module may be operated at an output voltage from 1.2 to 33V. A 2 Amp fuse is included on the module.

- Output voltage from 1.2 to 33 V*
- 2 A output current
- Line regulation is .005% (typical)
- 0.3% Load regulation (typical)
- 86 dB ripple rejection @ 120 Hz (typical)
- Easy access to voltage adjustment
- Other configurations available upon request



Voltage	Module Length	
	Cat. No.	(L) mm (in.)
1-2 - 33V	8804.3	45mm

*Note: Maximum input/output voltage differential: +35V.

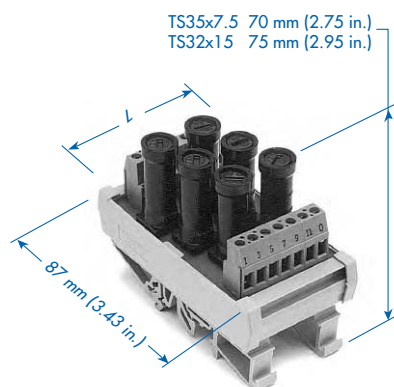
Fuse Module

INTERFACES

35 or 32mm DIN Rail

Protect circuits from overloads and short circuits. 3 or 6 vertical fuse holders have slotted screw caps for convenient fuse replacement (5x20 mm fuses). Modules with common bus are available upon request.

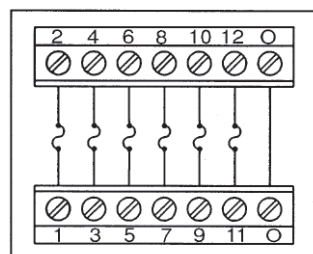
- Screw-Cage Clamp Connections
- Select 3 or 6 Fuse Holder Module
- DIN Rail Mount, Panel Mount Available



Wire Range	Current	Voltage
0.5-4mm ²		
22-12 AWG	6.3A ^b	250 V AC

Type	Cat. No.	Module Length (L) mm (in.)
FM3-E	5712.2	24 (.95)
FM6-E	5714.2	47 (1.85)

Std. Pk.: 1



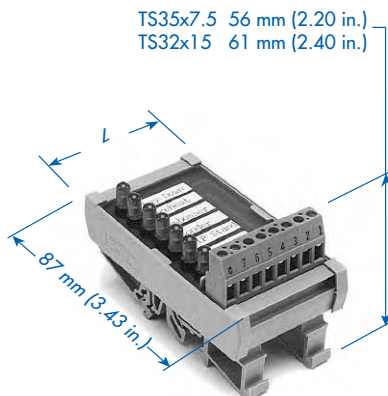
Indicator Module

INTERFACES

35 or 32mm DIN Rail

Monitor control functions and sequences to detect problems quickly and efficiently. The IM Indicator Modules are furnished with 7 red LEDs per module, and are available for various input voltages from 5 to 60V DC^c. Labels can be adhered to the board next to LEDs (Type B-619, manufactured by Brady®). Ask about our custom designs.

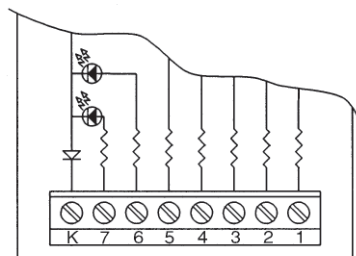
- Screw-Cage Clamp Connections
- DIN Rail Mount, Panel Mount Available



Wire Range	Current	Voltage
0.5-4mm ²		
22-12 AWG		

Type	Cat. No.	Input VDC	Drop R Ω	LED mA
IM7K/5	5750.2	4-6	220	12.0
IM7K/12	5751.2	9-15	1.0K	9.6
IM7K/24	5752.2	20-30	3.3K	6.5
IM7K/60	5753.2	50-70	10.0K	5.8

Std. Pk.: 1



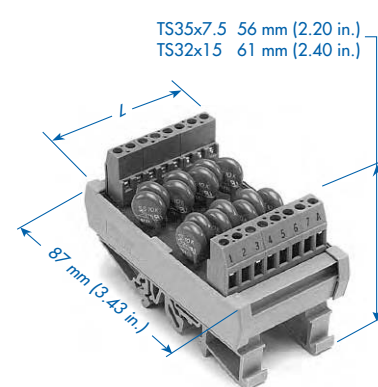
Surge Suppressor Module

INTERFACES

35 or 32mm DIN Rail

Protect personnel and equipment from damaging voltage surges, spikes and overvoltages from lightning, inductive switching or electrostatic discharge. Improve system reliability and reduce downtime with varistor overvoltage protection.

- Screw-Cage Clamp Connections
- Prevent Arcing at Contacts
- Absorb Switching Energy
- DIN Rail Mount, Panel Mount Available



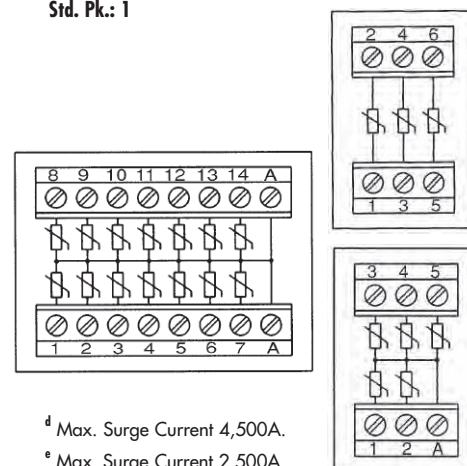
Wire Range	Current	Voltage
0.5-4mm ²		
22-12 AWG		

Type	Cat. No.	Module Length (L) mm (in.)	Operating Volts
Individually Wired Varistors			
SSM3-E/50	5730.2	24 (.95)	50V AC
SSM8-E/50	5731.2	47 (1.85)	50V AC
SSM3-E/275	5732.2	24 (.95)	275V AC
SSM8-E/275	5733.2	47 (1.85)	275V AC

Common Return

SSM5-R/50 ^d	5734.2	24 (.95)	50V AC
SSM14-R/50 ^d	5735.2	47 (1.85)	50V AC
SSM5-R/275 ^e	5736.2	24 (.95)	275V AC
SSM14-R/275 ^e	5737.2	47 (1.85)	275V AC

Std. Pk.: 1



^b Maximum per current path.

^c Other DC or AC voltages are available upon request.

^d Max. Surge Current 4,500A.

^e Max. Surge Current 2,500A.

INTERFACES

Relay Modules and Carriers

Isolated Channels

35 or 32mm DIN Rail

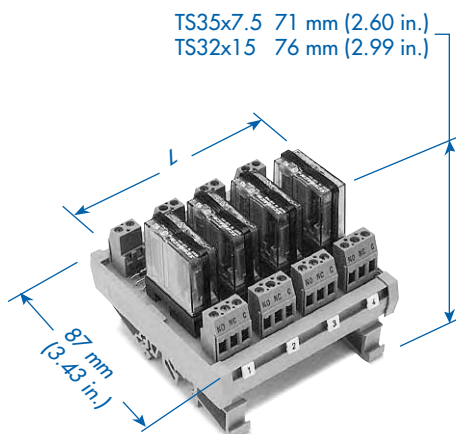
Isolated channels (no bus) allow control of each relay by a different logic system, if necessary. Mix sourcing (positive switching, Vcc on/off) and sinking (negative switching, ground on/off) on a single multi-relay module. Provide spare relay channels for future needs without committing to a specific logic power supply, and without committing coil-drive power for more than one relay at a time.

Altech Relay Modules provide high density packaging of miniature general purpose relays with Single Pole Double Throw (Form C) and Double Pole Double Throw (2 Form C) contact configurations and low current AC and DC coils. Load your own relays in our RC Relay Carrier, or order the RM Relay Module complete with relays.

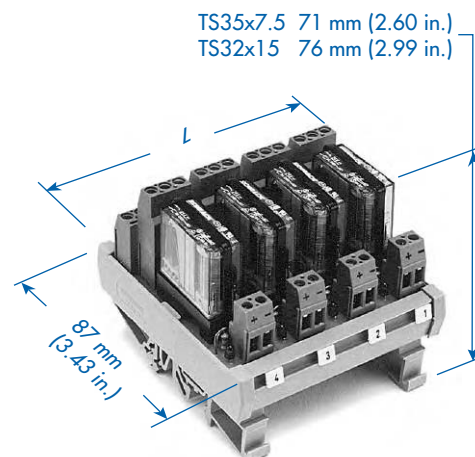
Call us with your custom module requirements!

- Screw-Cage Clamp Connections
- LED Coil Voltage Indicator
- Reverse DC Polarity LED Protection
- Surge Suppression with DC Coil
- DIN Rail Mount, Panel Mount Available

RC1 / RM1 Single Pole Double Throw



RC2 / RM2 Double Pole Double Throw

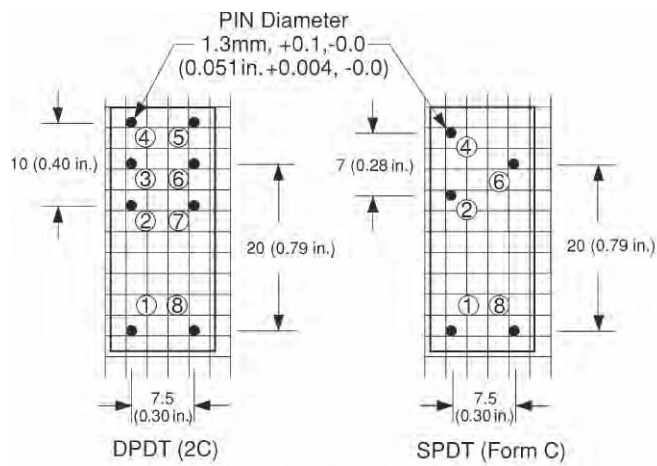


Wire Range	Contact Ratings	
	Current	Voltage
0.5-4mm ² 30-14 AWG	10A	250VAC/ 30VDC

Wire Range	Contact Ratings	
	Current	Voltage
0.5-4mm ² 30-14 AWG	2 x 5A	250VAC/ 30VDC

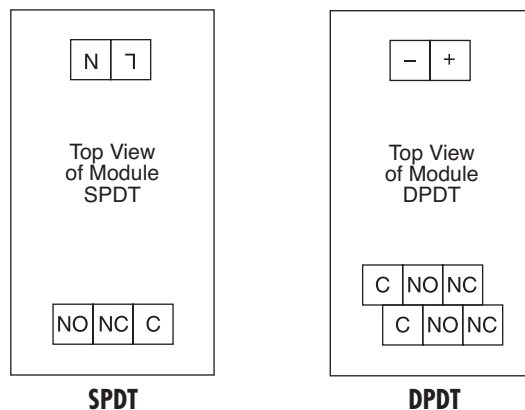
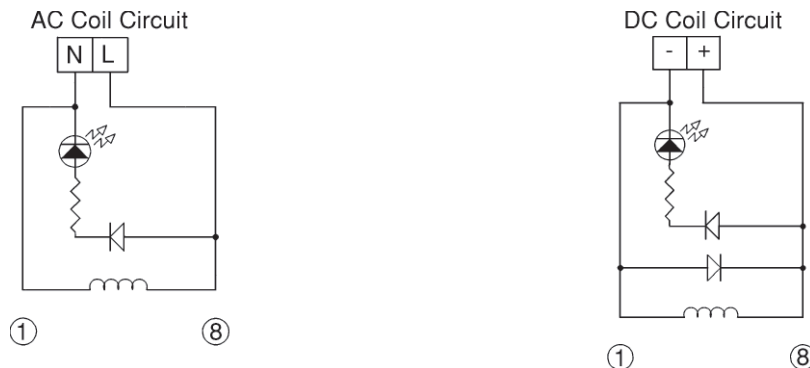
DIN Rail Mount, Panel Mount Available		Carrier Only		Module with Relays		Carrier Only		Module with Relays	
Ordering Information	Module Length (L) mm (in.)	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
1 Channel, Coil Voltage	21 (0.83)								
12V DC		RC1E1	8929.5	RM1E1	8929.2	RC2E1	8945.5	RM2E1	8949.2
24V DC		RC1G1	8933.5	RM1G1	8933.2	RC2G1	8951.5	RM2G1	8951.2
110V AC		RC1U1	8935.5	RM1U1	8935.2	RC2U1	8953.5	RM2U1	8953.2
220V AC		RC1X1	8940.5	RM1X1	8940.2	RC2X1	8954.5	RM2X1	8954.2
2 Channel, Coil Voltage	40 (1.57)								
12V DC		RC1E2	8929.6	RM1E2	8929.3	RC2E2	8949.6	RM2E2	8949.3
24V DC		RC1G2	8933.6	RM1G2	8933.3	RC2G2	8951.6	RM2G2	8951.3
110V AC		RC1U2	8935.6	RM1U2	8935.3	RC2U2	8953.6	RM2U2	8953.3
220V AC		RC1X2	8940.6	RM1X2	8940.3	RC2X2	8954.6	RM2X2	8954.3
4 Channel, Coil Voltage	79 (3.11)								
12V DC		RC1E4	8931.5	RM1E4	8931.2	RC2E4	8955.5	RM2E4	8955.2
24V DC		RC1G4	8941.5	RM1G4	8941.2	RC2G4	8956.5	RM2G4	8956.2
110V AC		RC1U4	8942.5	RM1U4	8942.2	RC2U4	8957.5	RM2U4	8957.2
220V AC		RC1X4	8943.5	RM1X4	8943.2	RC2X4	8959.5	RM2X4	8959.2
8 Channel, Coil Voltage	157 (6.18)								
12V DC		RC1E8	8931.6	RM1E8	8931.3	RC2E8	8955.6	RM2E8	8955.3
24V DC		RC1G8	8941.6	RM1G8	8941.3	RC2G8	8956.6	RM2G8	8956.3
110V AC		RC1U8	8942.6	RM1U8	8942.3	RC2U8	8957.6	RM2U8	8957.3
220V AC		RC1X8	8943.6	RM1X8	8943.3	RC2X8	8959.6	RM2X8	8959.3
16 Channel, Coil Voltage	311 (12.24)								
12V DC		RC1E16	8932.5	RM1E16	8932.2	RC2E16	8963.5	RM2E16	8963.2
24V DC		RC1G16	8944.5	RM1G16	8944.2	RC2G16	8972.5	RM2G16	8972.2
110V AC		RC1U16	8946.5	RM1U16	8946.2	RC2U16	8995.5	RM2U16	8995.2
220V AC		RC1X16	8948.5	RM1X16	8948.2	RC2X16	8999.5	RM2X16	8999.2
		Std. Pk.: 1		Std. Pk.: 1		Std. Pk.: 1		Std. Pk.: 1	

Relay Pinout

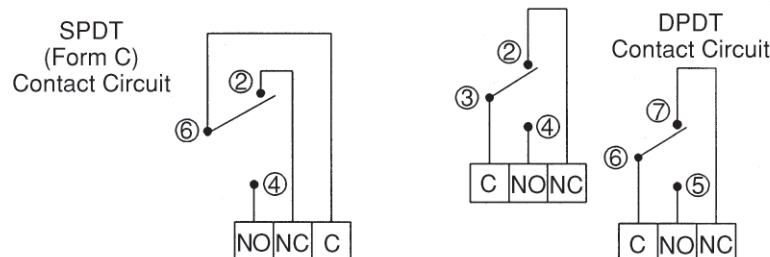


Bottom View, Relay Pinouts, Grid 2.54mm (0.1 in.)

Coil Circuits



Contact Circuits



Contact Specifications

SPDT Composite Rating: 10A

-Relay Socket: 10A
-Terminal Blocks: 15A

-PCB Trace for Contact Circuit
At 30°C (86°F) temperature rise NC: 12A
Common and NO: 16A
-PCB Trace for Coil Circuit: 6A
At 30°C (86°F) temperature rise

-Relay Contacts, AgNi, Minimum Ratings:
Resistive- At 250VAC and 30VDC: 10A
Inductive - At 250VAC : 7.5A
At 30VDC: 5A
(p.f = 0.4)

-Rated Minimum Breaking Capacity:
2,500 VA Resistive, 1,800 VA Inductive

DPDT Composite Rating: 2 x 8A

-Relay Socket: 10A
-Terminal Blocks: 15A

-PCB Trace for Contact Circuit:
At 30°C (86°F) temperature rise: 10A
-PCB Trace for Coil Circuit: 6A
At 30°C (86°F) temperature rise: 2A

-Relay Contacts, AgNi, Minimum Ratings:
Resistive- At 250VAC and 30VDC: 2 x 8A
Rated at 250VAC
Max. Breaking Voltage: 440VAC
"Make" Current: 12A

-Rated Minimum Breaking Capacity:
2,000 VA Resistive

Coil Specifications

-Ambient Temperatures:
40° to +70°C (-40° to +158°F)

Coil Voltage VDC	Operate (pull-in) Max. VDC	Drop Out (Rel.) V Min. VDC	Coil Current mA	Coil Resistance ohms
12	18	8.8	55	220±15%
24	42	17.5	20	1,200±15%
110	132	96.0	8.9	9,000±15%
220	264	192.0	4.1	31,500±15%

Table values are for cold coil at 20°C (68°F) and exclude coil exterior circuit.

INTERFACES

Relay Modules and Carriers

Bussed Channels

35 or 32mm DIN Rail

Altech Bussed Relay Modules provide high density packaging of miniature general purpose relays with minimal hook-up wiring. Select from bussed DC Positive (DC Negative switching), bussed DC Negative (DC Positive switching), or bussed AC neutral.

Ideal for traditional mechanical relay input/output array between a single logic system and peripheral devices, or between logic systems in a network as well as their peripheral and field devices.

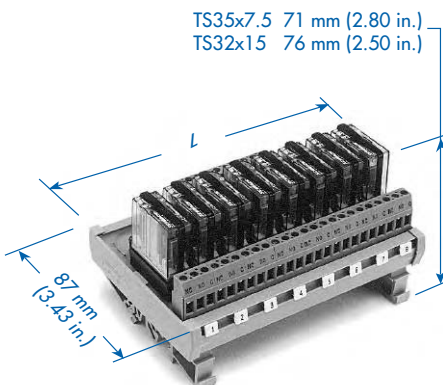
Load your own relays in our RCB Relay Carrier, or order the RMB Relay Module complete with 8 or 16 relays.

Call us with your custom module requirements!

- Screw-Cage Clamp Connections
- LED Coil Voltage Indicator
- Reverse DC Polarity LED Protection
- Surge Suppression With DC Coil
- DIN Rail Mount, Panel Mount Available

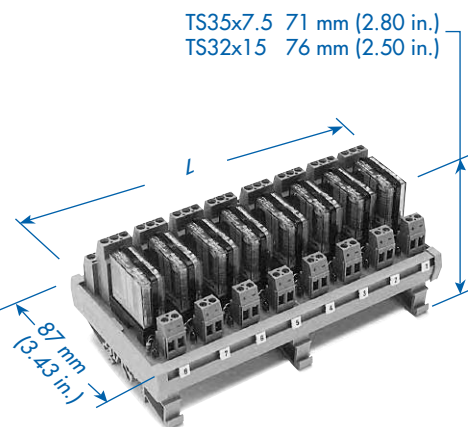
RC1 / RM1

Single Pole Double Throw



RC2 / RM2

Double Pole Double Throw



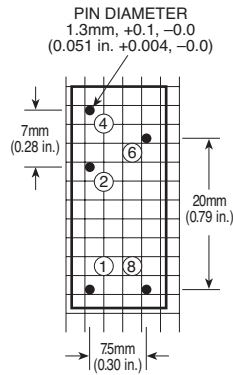
Wire Range	Contact Ratings	
	Current	Voltage
0.5-4mm ²		250VAC/ 30VDC
30-14 AWG	10A	

Wire Range	Contact Ratings	
	Current	Voltage
0.5-4mm ²		250VAC/ 30VDC
30-14 AWG	2 x 6A	

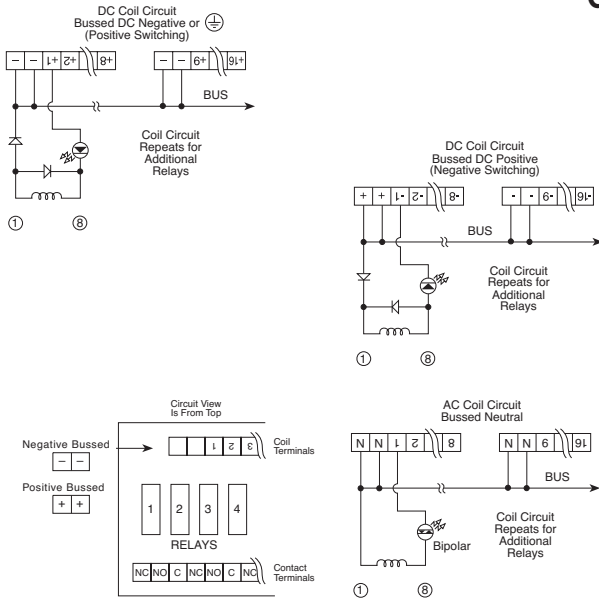
		Carrier Only		Module with Relays		Carrier Only		Module with Relays	
Ordering Information	Module Length (L) mm (in.)	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
8 Channel, Bussed DC+ 12V DC(E) 24V DC(G)	125 (4.92)	RCB1E8V	8912.5	RMB1E8V	8912.2	RCB2E8V	8923.5	RMB2E8V	8923.2
		RCB1G8V	5494.5	RMB1G8V	5494.2	RCB2G8V	8924.5	RMB2G8V	8924.2
8 Channel, Bussed DC-  12V DC(E) 24V DC(G)	125 (4.92)	RCB1E8G	8912.6	RMB1E8G	8912.3	RCB2E8G	8923.6	RMB2E8G	8923.3
		RCB1G8G	5492.5	RMB1G8G	5492.2	RCB2G8G	8924.6	RMB2G8G	8924.4
8 Channel, Bussed AC (N) 110V AC(U) 220V AC(X)	125 (4.92)	RCB1U8	5502.5	RMB1U8	5502.2	RCB2U8	8925.5	RMB2U8	8925.2
		RCB1X8	8913.6	RMB1X8	8913.3	RCB2X8	8925.6	RMB2X8	8925.3
16 Channel, Bussed DC+ 12V DC(E) 24VDC(G)	248 (9.76)	RCB1E16V	8914.5	RMB1E16V	8914.2	RCB2E16V	8926.5	RMB2E16V	8926.2
		RCB1G16V	5508.5	RMB1G16V	5508.2	RCB2G16V	8926.6	RMB2G16V	8926.3
16 Channel, Bussed DC-  12V DC(E) 24V DC(G)	248 (9.76)	RCB1E16G	8921.5	RMB1E16G	8921.2	RCB2E16G	8927.5	RMB2E16G	8927.2
		RCB1G16G	5506.5	RMB1G16G	5506.2	RCB2G16G	8927.6	RMB2G16G	8927.3
16 Channel, Bussed AC (N) 110V DC(U) 220V AC(X)	248 (9.76)	RCB1U16	5514.5	RMB1U16	5514.2	RCB2U16	8928.5	RMB2U16	8928.2
		RCB1X16	5514.6	RMB1X16	5514.3	RCB2X16	8928.6	RMB2X16	8928.3
		Std. Pk.: 1		Std. Pk.: 1		Std. Pk.: 1		Std. Pk.: 1	

Single Pole Double Throw (SPDT)

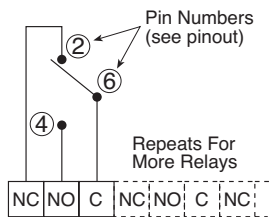
Relay Pinout Bottom View



Coil Circuits



Contact Circuits



Contact Specifications

SPDT Composite Rating:

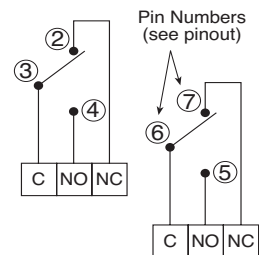
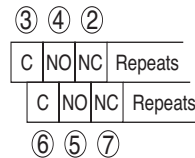
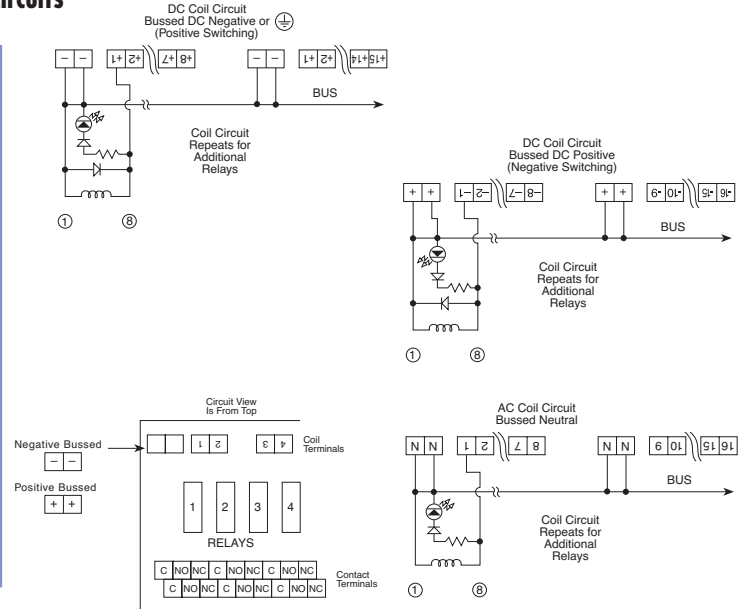
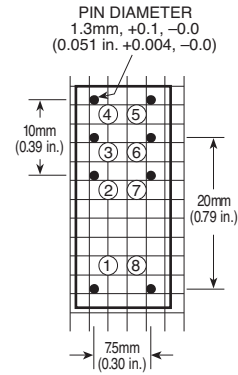
-Relay Socket:	10A
-Terminal Blocks:	15A
-PCB Trace for Contact Circuit	
At 30°C (86°F) temperature rise:	12A*
-PCB Trace for Coil Circuit	
At 30°C (86°F) temperature rise:	4A
-PCB Trace for Bus	
At 30°C (86°F) temperature rise:	16A
-Relay Contacts, AgCdO, Minimum Ratings	
Resistive - At 250VAC and 30VDC:	10A
Inductive - At 250VAC:	7.5A
At 30VDC:	5A
(p.f. = 0.4)	
-Minimum Breaking Capacity:	

Contact Specifications

DPDT Composite Rating:

-Relay Socket:	10A
-Terminal Blocks:	15A
-PCB Trace for Contact Circuit:	8A
At 30°C (86°F) temperature rise:	8A
-PCB Trace for Bus	
At 30°C (86°F) temperature rise:	16A
-PCB Trace for Coil Circuit:	1A
At 30°C (86°F) temperature rise:	2A
-Relay Contacts, AgCdO, Minimum Ratings	
Resistive - At 250VAC and 30VDC:	8A
Rated at 250VAC	
Max. Breaking Voltage:	440VAC
"Make" Current:	12A
-Rated Minimum Breaking Capacity:	
2,000 VA Resistive	

Double Pole Double Throw (DPDT)



Coil Specifications

Ambient Temperatures:
-40° to +70°C (-40° to +158°F)

Coil Voltage VDC	Operate (pull-in) Max. VDC	Drop Out (Rel.) V Min. VDC	Coil Current mA	Coil Resistance ohms
12	18	8.8	55	220±15%
24	42	17.5	20	1,200±15%
110	132	96.0	8.9	9,000±15%
220	264	192.0	4.1	31,500±15%

Table values are for cold coil at 20°C (68°F) and exclude coil exterior circuit.

* 12A overall rating, with 12A contact relays soldered directly to printed circuit board (no socket) are available. Please consult Altech.

INTERFACES

Relay Modules - High Current Isolated Channels - 15 Amp 35 or 32mm DIN Rail

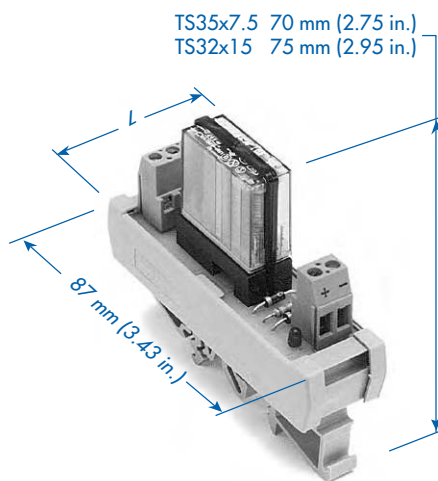
A true high-current rating in a DIN Rail mount miniature relay module. The miniature relays used in the Altech RMH have a SPDT (Form C) 16 Amp continuous current rating, developed from dual 8 Amp contacts that are internally connected in parallel. The relay socket is rated dual 8 Amp. Printed circuit traces are balanced, rated 16 Amp and connect to Altech terminal blocks UL rated 15A/300V.

Typical relay specifications combined with other module component ratings give module ratings suitable for many control applications.

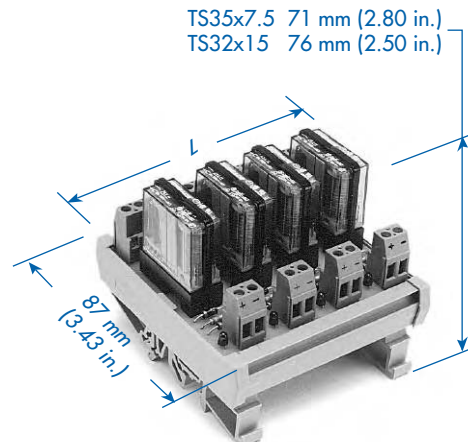
Resistive: 15A at 250V AC/30V DC
 Inductive: 8A at 250V AC/30V DC
 Tungsten (TV-3): 3A at 120V AC
 Motor: 1/3hp at 120V AC
 1/2hp at 250V AC

- Screw-Cage Clamp Connection
- LED Coil Voltage Indicator
- Reverse DC Polarity LED Protection
- Surge Suppression With DC Coils
- Industry Standard Relays^a
- DIN Rail Mount, Panel Mount Available

RMH1 - 1 Channel Single Pole Double Throw



RMH4 - 4 Channel Single Pole Double Throw



Wire Range	Contact Ratings	
	Current	Voltage
0.5-4mm ² 30-14 AWG	15A	250VAC/ 30VDC

Wire Range	Contact Ratings	
	Current	Voltage
0.5-4mm ² 30-14 AWG	15A	250VAC/ 30VDC

Ordering Information

Relay Module, Coil Voltage

5V DC
 6V DC
 12V DC
 24V DC
 48V DC
 60V DC
 110V DC

6V AC
 12V AC
 24V AC
 50V AC
 110V AC
 220V AC
 240V AC

Type	Cat. No.	LED ^b (2mA)
RMH1B	8905.2	Yellow
RMH1C	8906.2	Green
RMH1E	8907.2	Red
RMH1G	5800.2	Yellow
RMH1J	5802.2	Green
RMH1K	8908.2	Red
RMH1M	5803.2	Red
RMH1N	8909.2	Green
RMH1R	8910.2	Red
RMH1S	5801.2	Red
RMH1T	8911.2	Red
RMH1U	5804.2	Yellow
RMH1X	5805.2	Green
RMH1Y	5806.2	Red

Type	Cat. No.	LED ^c (2mA)
RMH4B	8905.3	Yellow
RMH4C	8906.3	Green
RMH4E	8907.3	Red
RMH4G	5800.3	Yellow
RMH4J	5802.3	Green
RMH4K	8908.3	Red
RMH4M	5803.3	Red
RMH4N	8909.3	Green
RMH4R	8910.3	Red
RMH4S	5801.3	Red
RMH4T	8911.3	Red
RMH4U	5804.3	Yellow
RMH4X	5805.3	Green
RMH4Y	5806.3	Red

Std. Pk.: 1

Std. Pk.: 1

General Relay Specifications (Typical)

Mechanical Life: 30 x 10⁶ ops
 Max. No. of Switching Cycles at Rated Load: 1200 ops/hr
 Operate Time (pick-up): 9ms
 Release Time (drop-out): 3ms
 Bounce Time: 2ms

Module Length (L) 21mm (0.83 in.)

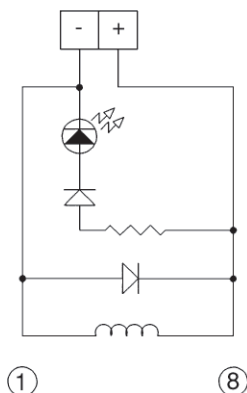
Module Length (L) 79mm (3.11 in.)

^a Catalog specifications from several manufacturers of the 16 Amp (dual 8 Amp) relay are available, please consult Altech.

^b For alternate LED colors, please consult Altech.

^c For alternate LED colors, please consult Altech.

DC Coil Circuit



DC Coil Circuit Specifications (Typical)

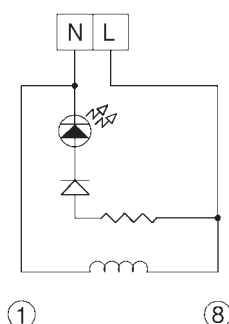
Ambient temperature range: -40° to 70°C (-40° to 158°F)

Table values are for cold coil at 20°C (68°F) and exclude coil exterior circuit.

Coil Voltage V AC	Operate (pull-in) V Max. V AC	Drop-Out (rel.) V Min. V AC	Coil Current mA(50/60Hz)	Coil Resistance Ohms
5	3.5	0.5	92.6	54±15%
6	4.2	0.6	88.2	68±10%
12	8.7	1.2	44.4	270±10%
24	16.8	2.4	21.8	1,100±15%
48	33.6	4.8	11.4	4,200±15%
60	42.0	6.0	9.2	6,540±15%
110	77.0	11.0	4.8	23,100±15%

Diode: 1N4007 or equivalent

AC Coil Circuit



AC Coil Circuit Specifications (Typical)

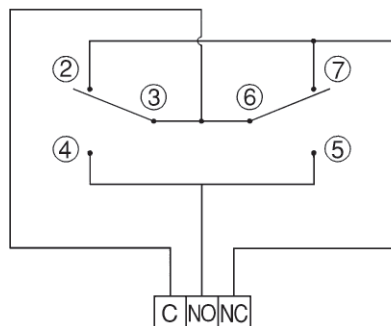
Ambient temperature range: -40° to 60°C (-40° to 140°F)

Table values are for cold coil at 20°C (68°F) and exclude coil exterior circuit.

Coil Voltage V AC	Operate (pull-in) V Max. V AC	Drop-Out (rel.) V Min. V AC	Coil Current mA(50/60Hz)	Coil Resistance Ohms
6	4.8	1.8	190/150	15±10%
12	9.6	3.6	90/75	65±10%
24	19.2	7.2	44/35	280±10%
50	40.0	15.0	22/18	1,130±10%
115	92.0	34.5	11/9	5,600±15%
220	176.0	66.0	5/4	23,400±15%
240	176.0	66.0	4.7/4.1	23,400±15%

Diode: 1N4007 or equivalent

Contact Circuit



Contact Specifications (Typical)

Rated Current (Resistive):	16A
Rated Current (Ind. P.F. = 0.4):	8A
At Rated Voltage:	30V DC, 250V AC
Max. Operating Voltage:	125V DC, 380V AC
Breaking Current (Resistive):	25A
Breaking Capacity (Resistive):	4,000VA
Contact Material:	AgCdO
Contact Electrical Life:	Min. 10 ⁵ ops
	(AC Resistive Load)

SAFETY RELAY MODULES

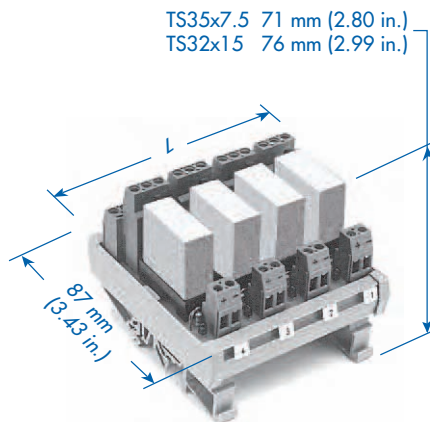
8 Amp Contacts, 35 or 32mm DIN Rail

Altech Safety Relay Modules utilize Relays with Force-Guided-Contacts that meet or exceed international standards, TÜV, SA, SUVA, and UL. They are designed to protect man and machine as specified in OSHA FR1910 Regulations, a mandatory requirement of the European Machinery Directive EMD 89.392 EEC. The Safety Relays are used in Safety Devices such as Emergency Stop Modules, Safety Gate Monitors, 2-Hand Safety Modules, etc.

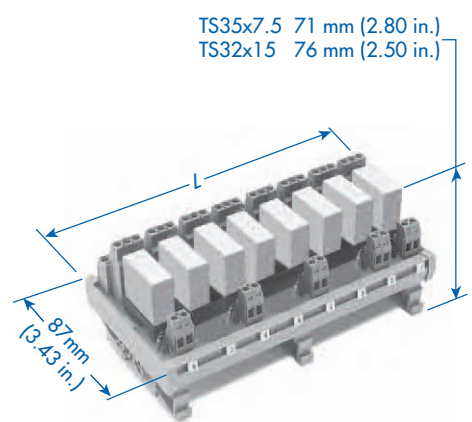
This series of Safety Relay Modules are Double Pole, Double Throw configurations, and are available as 1, 2, 4, 8 and 16 isolated channels and 8 and 16 bussed channels with 12 or 24 VDC coils. Isolated channels allow control of each relay by a different logic system, if necessary. There are two inputs for each relay coil per channel. Bussed channels allow high density packaging with a common input for all relays. Safety Relay Modules may be ordered with three different types of relay contact material, depending on the actual load current.

- Screw-Cage Clamp Connection
- LED Coil Voltage Indicator
- Reverse DC Polarity LED Protection
- Surge Suppression With DC Coils
- Industry Standard Relays
- DIN Rail Mount, Panel Mount Available

Isolated Channel Double Pole Double Throw

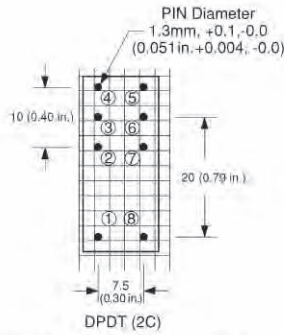


Bussed Channel Double Pole Double Throw

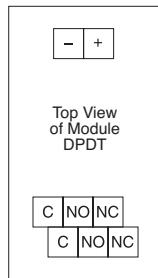
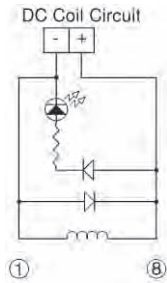


		Contact Material: AgCdO+0.2µmAu	Contact Ratings: 8A(2x5A) 110DC, 250VAC	Contact Material: AgNi10+0.2µmAu	Contact Ratings: 8A(2x5A) 110DC, 250VAC	Contact Material: AgNi10+5µmAu	Contact Ratings: 8A(2x5A) 110DC, 250VAC
Isolated Channels (No Bus)	Length (L) mm (in.)	Type/Cat. No.	Type/ Cat. No.	Type/Cat. No.	Type/Cat. No.	Type/Cat. No.	Type/Cat. No.
1 Channel, Coil Voltage 12V 24V	21 (0.83)	8949.2C 8951.2C	8949.2N 8951.2N	8949.2S 8951.2S			
2 Channel, Coil Voltage 12V 24V	40 (1.57)	8949.3C 8951.3C	8949.3N 8951.3N	8949.3S 8951.3S			
4 Channel, Coil Voltage 12V 24V	79 (3.11)	8955.2C 8956.2C	8955.2N 8956.2N	8955.2S 8956.2S			
8 Channel, Coil Voltage 12V 24V	157 (6.18)	8955.3C 8956.3C	8955.3N 8956.3N	8955.3S 8956.3S			
16 Channel, Coil Voltage 12V 24V	311 (12.24)	8963.2C 8972.2C	8963.2N 8972.2N	8963.2S 8972.2S			
Bussed Channels	Length (L) mm (in.)	Type/Cat. No.	Type/Cat. No.	Type/Cat. No.	Type/Cat. No.	Type/Cat. No.	Type/Cat. No.
8 Channel, Bussed DC+ 12V 24V	125 (4.92)	8923.2C 8924.2C	8923.2N 8924.2N	8923.2S 8924.2S			
8 Channel, Bussed DC- 12V 24V	125 (4.92)	8923.3C 8924.4C	8923.3N 8924.4N	8923.3S 8924.4S			
16 Channel, Bussed DC+ 12V 24V	248 (9.76)	8926.2C 8926.3C	8926.2N 8926.3N	8926.2S 8926.3S			
16 Channel, Bussed DC- 12V 24V	248 (9.76)	8927.2C 8927.3C	8927.2N 8927.3N	8927.2S 8927.3S			

Isolated Channel, DPDT

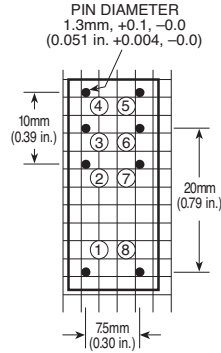


Bottom View, Relay Pinouts, Grid 2.54mm (0.1 in.)

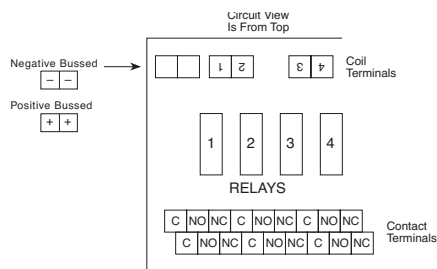
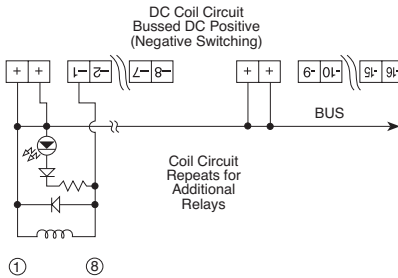
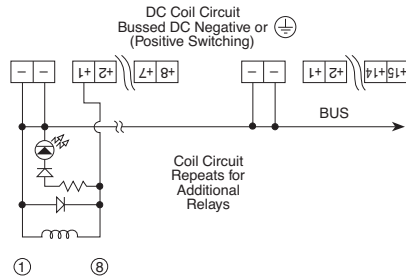


Bussed Channel, DPDT

Relay Pinout

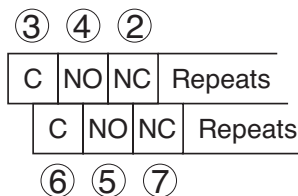
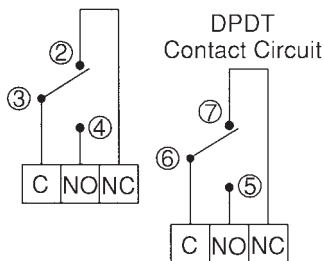


Coil Circuits



Contact Circuits

For Both Isolated and Bussed Channels



Relay Specifications

-Normal Coil Voltage: 12,24 VDC
-Coil Power Dissipation: 0.7W
-Max. Switching Voltage: 250 VDC, 400 AC
-Max. Switching Current: 8A(2x5A simultaneous)

-Max. Switching Power
DC 200W (2x160W simultaneous)
AC 2000VA (2x1250VA simultaneous)

-Contact Switching Rate: 10 operations/ sec.
-Relay Operate Time: 15 ms
-Relay Release Time: 12 ms
-Contact Arrangements: DPDT, 2 FORM C

-Contact Material:
Standard AgNi10+0.2µmAu
Optional AgNi0.15+5µmAu
AgNi10+5µmAu

-Mechanical Life: 50x10⁶ operation cycles
-Ambient Temperature: -40° + 60°C
-Cover Material: Polyamide 6
-Weight: 15g

Coil Specifications

Rated Voltage	Voltage Range	Coil Resistance
12VDC	9.6V-19.2V	210Ω ± 15%
24VDC	19.2V-38.4V	820Ω ± 15%

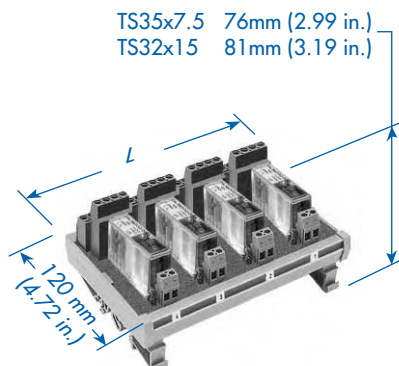
SAFETY RELAY MODULES

4 Pole Relays, 8 or 10 Amps

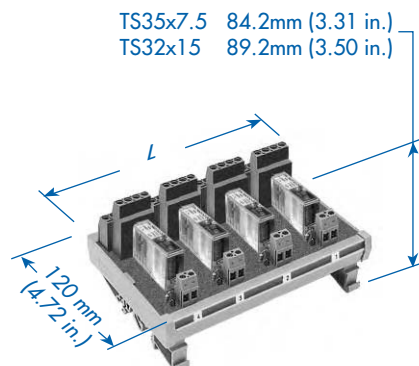
Altech Safety Relay Modules utilize Relays with Force-Guided-Contacts that meet or exceed international standards, TÜV, SA, SUVA, and UL. They are designed to protect man and machine as specified in OSHA CFR1910 Regulations, which is a mandatory requirement of the European Machinery Directive EMD 89.392 EEC.

- Screw-Cage clamp Connections
- LED Coil Voltage Indicator
- Reverse DC Polarity LED Protection
- Surge Suppression With DC Coil
- Din Rail Mount, Panel Mount Available

4 Pole, 8 Amp



4 Pole, 10 A



Contact Material*:
AgCd0 + 0.2µmAu

Contact Ratings:
8A(2x5A) 250VDC, 400VAC

Contacts:

2N.O + 2N.C

3N.O + 1N.C

Contact Material*:
AgCd0 + 0.2µmAu

Contact Ratings:
10A(2x5A) 250VDC, 400VAC

Contacts:

2N.O + 2N.C

3N.O + 1N.C

Ordering Information	Length (L) mm (in.)	Type/ Cat. No	Type/ Cat. No.	Type/ Cat. No.	Type/ Cat. No.
1 Channel, Coil Voltage 12V 24V	40.10 (1.58)	156.0A11.1222C	156.0A11.1231C	156.0A01.1222C	156.0A01.1231C
		156.0A11.2422C	156.0A11.2431C	156.0A01.2422C	156.0A01.2431C
2 Channel, Coil Voltage 12V 24V	78.20 (3.08)	256.0A11.1222C	256.0A11.1231C	256.0A01.1222C	256.0A01.1231C
		256.0A11.2422C	256.0A11.2431C	256.0A01.2422C	256.0A01.2431C
4 Channel, Coil Voltage 12V 24V	154.40 (6.08)	456.0A11.1222C	456.0A11.1231C	456.0A01.1222C	456.0A01.1231C
		456.0A11.2422C	456.0A11.2431C	456.0A01.2422C	456.0A01.2431C

Altech Safety Relays are electro-mechanical relays that are mechanically linked together, causing all contacts to move together when the coil is energized. Force-Guided-contacts are also known as positive-guided-contacts, captive contacts or locked contacts. In addition, our Safety Relays have Crown Contacts which provide two locations per contacts to improve switching conditions. The Safety Relays are used in Safety Devices such as Emergency Stop Modules, Safety Gate Monitors, 2-Hand Safety Modules, Safety Light Curtains, etc.

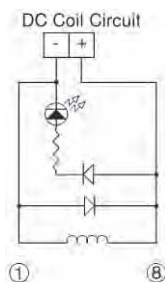
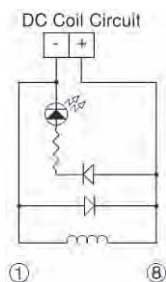
This series of Safety Relay Modules consist of 4 pole relays with two choices of configurations (2NO/2NC or 3NO/1NC), with 8 or 10 Amp contacts, and are available as 1, 2, and 4 isolated channels with 12, or 24 VDC coils. Isolated channels allows control of each relay by a different logic system, if necessary. There are two inputs for each relay coil per channel. Safety Relay Modules may be ordered with three different types of relay contact material, depending on the actual load current. The part numbers shown in this data sheet are for our standard contact material, which is AgCd0 + 0.2µmAu.

* Note: Additional relay contact materials are available upon request. Please contact Altech for additional information.

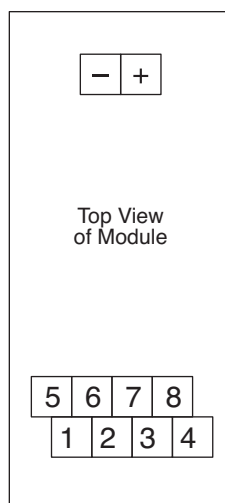
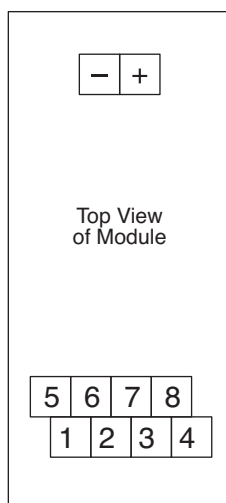
4 Pole, 8 Amps

4 Pole, 10 Amps

DC Coil Circuits



Contact Circuits



Relay Configurations

2 N.O + 2 N.C
NO Pin (1,2), (5,6)
NC Pin (3,4), (7,8)

3 N.O + 1 N.C
NO Pin (1,2), (5,6), (7,8)
NC Pin (3,4)

Relay Configurations

2 N.O + 2 N.C
NO Pin (3,4), (7,8)
NC Pin (1,2), (5,6)

3 N.O + 1 N.C
NO Pin (3,4), (5,6), (7,8)
NC Pin (1,2)

Relay Specifications - 8 Amps

-Normal Coil Voltage: 12,24 VDC
-Coil Power Dissipation: 0.6W
-Max. Switching Voltage: 250VDC, 400VAC
-Max. Switching Current: 8A

-Max. Switching Power
DC 200W
AC 2000VA

-Contact Switching Rate: 10 operations/ sec.
-Relay Operate Time 20 ms
-Relay Release Time 6 ms
-Contact Arrangements 2NO/2NC, 3NO/1NC

-Contact Material:
Standard AgSnO₂+0.2μmAu
Optional AgNi10+0.2μmAu
AgNi10+5μmAu

-Mechanical Life: 50x10⁶ operation cycles
-Ambient Temperature: -25°+ 85°C
-Cover Material: Thermoplast
-Weight: 35g

Coil Specifications

Rated Voltage	Voltage Range	Coil Resistance
12VDC	8.4V-16.8V	240Ω ± 15%
24VDC	16.8V-33.6V	960Ω ± 15%

Relay Specifications - 10 Amps

-Normal Coil Voltage: 12,24 VDC
-Coil Power Dissipation: 0.75W
-Max. Switching Voltage: 250VDC, 400VAC
-Max. Switching Current: 10A

-Max. Switching Power
DC 240W
AC 2500VA

-Contact Switching Rate: 10 operations/ sec.
-Relay Operate Time 27 ms
-Relay Release Time 5 ms
-Contact Arrangements 2NO/2NC, 3NO/1NC

-Contact Material:
Standard AgSnO₂+0.2μmAu
Optional AgNi10+0.2μmAu
AgNi10+5μmAu

-Mechanical Life: 30x10⁶ operation cycles
-Ambient Temperature: -25°+ 80°C
-Cover Material: Thermoplast
-Weight: 75g

Coil Specifications

Rated Voltage	Voltage Range	Coil Resistance
12VDC	8.4V-19.2V	192Ω ± 15%
24VDC	16.8V-38.4V	770Ω ± 15%

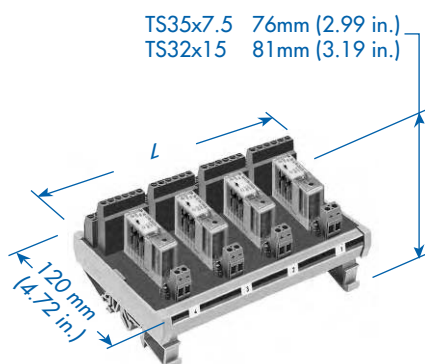
SAFETY RELAY MODULES

6 Pole Relays, 8 or 10 Amps

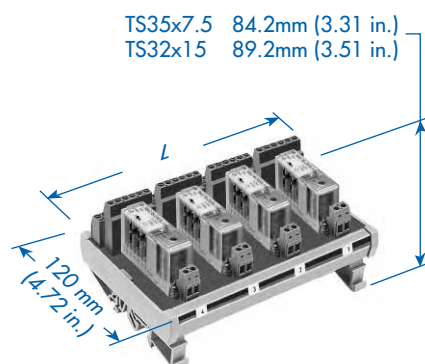
Altech Safety Relay Modules utilize Relays with Force-Guided-Contacts that meet or exceed international standards, TÜV, SA, SUVA, and UL. They are designed to protect man and machine as specified in OSHA CFR1910 Regulations, which is a mandatory requirement of the European Machinery Directive EMD 89.392 EEC.

- Screw-Cage clamp Connections
- LED Coil Voltage Indicator
- Reverse DC Polarity LED Protection
- Surge Suppression With DC Coil
- Din Rail Mount, Panel Mount Available

6 Pole, 8 Amps



6 Pole, 10 Amps



		Contact Material*: AgCdO+0.2µmAu Contact Ratings: 8A(2x5A) 250VDC,400VAC Contacts: 2N.O + 4N.C 3N.O + 3N.C 4N.O + 2N.C			Contact Material*: AgCdO+0.2µmAu Contact Ratings: 10A(2x5A) 250VDC,400VAC Contacts: 2N.O + 4N.C 3N.O + 3N.C 4N.O + 2N.C		
Ordering Information	Length (L) mm (in.)	Type/ Cat. No.	Type/ Cat. No.	Type/ Cat. No.	Type/ Cat. No.	Type/ Cat. No.	Type/ Cat. No.
1 Channel, Coil Voltage 12V 24V	46.45 (1.83)	156.0A12.1224C	156.0A12.1233C	156.0A12.1242C	156.0A02.1224C	156.0A02.1233C	156.0A02.1242C
		156.0A12.2424C	156.0A12.2433C	156.0A12.2442C	156.0A12.2424C	156.0A02.2433C	156.0A02.2442C
2 Channel, Coil Voltage 12V 24V	90.90 (3.58)	256.0A12.1224C	256.0A12.1233C	256.0A12.1242C	256.0A02.1224C	256.0A02.1233C	256.0A02.1242C
		256.0A12.2424C	256.0A12.2433C	256.0A12.2442C	256.0A12.2424C	256.0A02.2433C	256.0A02.2442C
4 Channel, Coil Voltage 12V 24V	179.80 (7.08)	456.0A12.1224C	456.0A12.1233C	456.0A12.1242C	456.0A02.1224C	456.0A02.1233C	456.0A02.1242C
		456.0A12.2424C	456.0A12.2433C	456.0A12.2442C	456.0A12.2424C	456.0A02.2433C	456.0A02.2442C

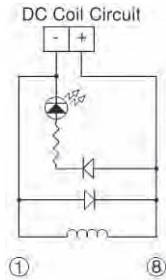
Altech Safety Relays are electro-mechanical relays that are mechanically linked together, causing all contacts to move together when the coil is energized. Force-Guided-contacts are also known as positive-guided-contacts, captive contacts or locked contacts. In addition, our Safety Relays have Crown Contacts which provides two locations per contacts to improve switching conditions. The Safety Relays are used in Safety Devices such as Emergency Stop Modules, Safety Gate Monitors, 2-Hand Safety Modules, Safety Light Curtains, etc.

This series of Safety Relay Modules consist of 6 pole relays with three configuration choices (2NO+4NC, 3NO+3NC, 4NO+2NC), 8 or 10 Amp contacts and either 1, 2 and 4 isolated channels with 12 or 24 VDC coils. Isolated channels allow control of each relay by a different logic system, if necessary. There are two inputs for each relay coil channel. Modules can ordered with three contact materials, dependent upon the actual current load. The standard contact material is AgCdO+0.2µmAu.

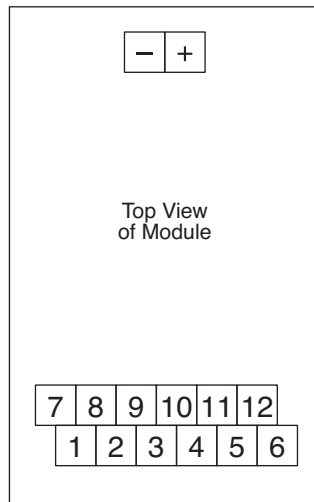
* Note: Additional relay contact materials are available upon request. Please contact Altech for additional information.

6 Pole, 8 Amps

DC Coil Circuits



Contact Circuits



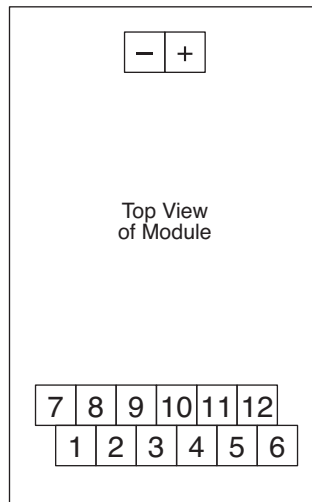
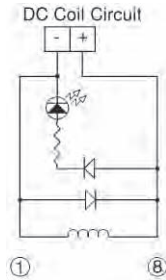
Relay Configurations

2N.O + 4N.C
 NO Pin (1,2), (7,8)
 NC Pin (3,4), (5,6), (9,10), (11,12)

3N.O + 3N.C
 NO Pin (1,2), (7,8), (9,10)
 NC Pin (3,4), (5,6), (11,12)

4N.O + 2N.C
 NO Pin (1,2), (3,4), (7,8), (9,10)
 NC Pin (5,6), (11,12)

6 Pole, 10 Amps



Relay Configurations

2N.O + 4N.C
 NO Pin (5,6), (11,12)
 NC Pin (1,2), (3,4), (7,8), (9,10)

3N.O + 3N.C
 NO Pin (3,4), (5,6), (11,12)
 NC Pin (1,2), (7,8), (9,10)

4N.O + 2N.C
 NO Pin (3,4), (5,6), (9,10), (11,12)
 NC Pin (1,2), (7,8)

Relay Specifications - 8 Amps

-Normal Coil Voltage: 12,24 VDC
 -Coil Power Dissipation: 0.8-1.0 W
 -Max. Switching Voltage: 250VDC, 400VAC
 -Max. Switching Current: 8A

-Max. Switching Power
 DC 200W (2x160W simultaneous)
 AC 2000VA (2x1250VA simultaneous)

-Contact Switching Rate: 10 operations/ sec.
 -Relay Operate Time 20 ms
 -Relay Release Time 6 ms
 -Contact Arrangements 2NO/4NC, 3NO/3NC, 4NO/2NC

-Contact Material:
 Standard AgSnO₂+0.2μmAu
 Optional AgNi10+0.2μmAu
 AgNi10+5μmAu

-Mechanical Life: 50x10⁶ operation cycles
 -Ambient Temperature: -25° + 85°C
 -Cover Material: Thermoplast
 -Weight: 38g

Coil Specifications

Rated Voltage	Voltage Range	Coil Resistance
12VDC	8.4V-16.8V	145Ω ± 15%
24VDC	16.8V-33.6V	600Ω ± 15%

Relay Specifications - 10 Amps

-Normal Coil Voltage: 12,24 VDC
 -Coil Power Dissipation: 1.0 W
 -Max. Switching Voltage: 250VDC, 400VAC
 -Max. Switching Current: 10A

-Max. Switching Power
 DC 240W
 AC 2500VA

-Contact Switching Rate: 10 operations/ sec.
 -Relay Operate Time 27 ms
 -Relay Release Time 5 ms
 -Contact Arrangements 2NO/4NC, 3NO/3NC, 4NO/2NC

-Contact Material:
 Standard AgSnO₂+0.2μmAu
 Optional AgNi10+0.2μmAu
 AgNi10+5μmAu

-Mechanical Life: 30x10⁶ operation cycles
 -Ambient Temperature: -25° + 80°C
 -Cover Material: Thermoplast
 -Weight: 85g

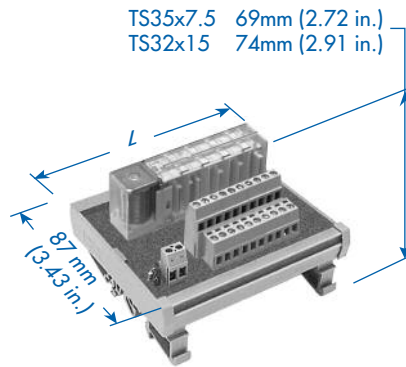
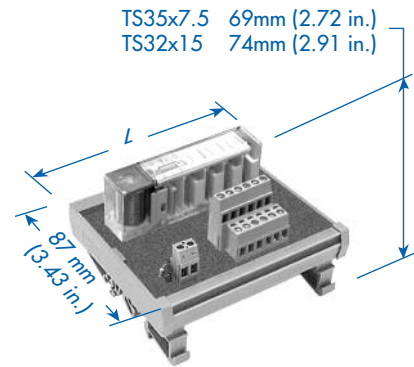
Coil Specifications

Rated Voltage	Voltage Range	Coil Resistance
12VDC	8.4V-19.2V	140Ω ± 15%
24VDC	16.8V-38.4V	570Ω ± 15%

SAFETY RELAY MODULES**10 Pole Relays, 10 Amp Contacts
6 Pole Relays, 4 @ 16 Amps,
2 @ 6 Amps**

These Safety Relay Modules utilize Relays with Force-Guided-Contacts that meet or exceed international standards, TÜV, SA, SUVA, and UL. They meet the standard EN50205 for safety relays, UL/94/VO fire protection, VDE 0106 Protection Class 11, and VDE 0110/group C 250VAC insulation class.

- Screw-Cage clamp Connections
- LED Coil Voltage Indicator
- Reverse DC Polarity LED Protection
- Surge Suppression With DC Coil
- Din Rail Mount, Panel Mount Available

10 Pole, 10 Amps**6 Pole,
4- 16 Amps, 2- 6 Amps**

Contact Material:
AgSnO₂+0.2µmAu

Contact Ratings:
10A 250VAC

Contacts:

3N.O + 7N.C

7N.O + 3N.C

8N.O + 2N.C

9N.O + 1N.C

Contact Material:
AgSnO₂+0.2µmAu

Contact Ratings:
16A + 6A 250VAC

Contacts:

4N.O @ 16A + 1N.O/1N.C @ 6A

Ordering Information	Length (L) mm (in.)	Type/ Cat. No.	Type/ Cat. No.	Type/ Cat. No.	Type/ Cat. No.	Type/ Cat. No
1 Channel, Coil Voltage	103.6 (4.08)					
12V		1SIR37212	1SIR73212	1SIR82212	1SIR91212	1SIP51212
24V		1SIR37224	1SIR73224	1SIR82224	1SIR91224	1SIP51224

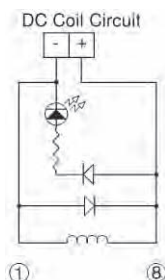
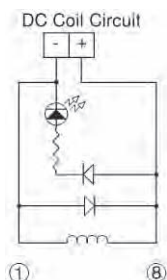
Altech Safety Relays are electro-mechanical relays that are mechanically linked together, causing all contacts to move together when the coil is energized. Force-Guided-contacts are also known as positive-guided-contacts, captive contacts or locked contacts. In addition, our Safety Relays have Crown Contacts which provides two locations per contacts to improve switching conditions. The Safety Relays are used in Safety Devices such as Emergency Stop Modules, Safety Gate Monitors, 2-Hand Safety Modules, Safety Light Curtains, etc.

This series of Safety Relay Modules consists of 10 pole relays with 10 Amps in four configurations choices (3NO/7NC, 7NO/3NC, 8NO/2NC, 9NO/1NC), and 6 pole relays with 6 and 16 Amp contacts (6 Amp is 1NC/1NC, 16 Amp is 4NO). Relays are available as single channel units with 12, or 24 VDC coils. Standard contact material for this series is AgSnO₂ + 0.2µmAu.

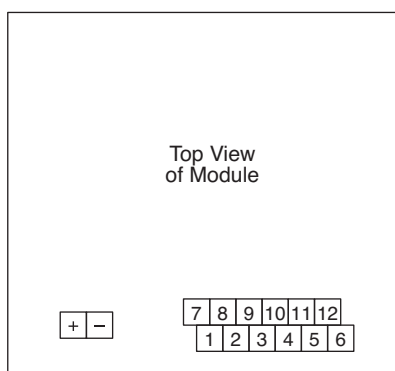
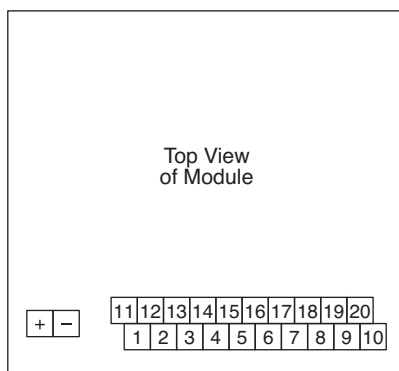
10 Pole, 10 Amps

6 Pole, 4 @ 16Amps, 2 @ 6 Amps

DC Coil Circuits



Contact Circuits



Relay Configurations

3N.O + 7N.C

NO Pin (9,10), (11,12), (19,20)

NC Pin (1,2), (3,4), (5,6), (7,8), (13,14),
(15,16), (17,18)

7N.O + 3N.C

NO Pin (5,6), (7,8), (9,10), (11,12), (15,16),
(17,18), (19,20)

NC Pin (1,2), (3,4), (13,14)

8N.O + 2N.C

NO Pin (3,4), (5,6), (7,8), (9,10), (11,12),
(15,16), (17,18), (19,20)

NC Pin (1,2), (13,14)

9N.O + 2N.C

NO Pin (3,4), (5,6), (7,8), (9,10), (11,12),
(13,14), (15,16), (17,18), (19,20)

NC Pin (1,2)

Relay Configurations

4N.O (16 Amps)

(9,10), (3,4), (11,12), (5,6)

1N.O + 1N.C (6 Amps)

NO Pin (1,2)

NC Pin (7,8)

Relay Specifications - 10 Pole

-Normal Coil Voltage:	12,24 VDC
-Coil Power Dissipation:	1.3W
-Max. Switching Voltage:	250VAC
-Max. Switching Current:	10A

-Max. Switching Power:	2500VAC
------------------------	---------

-Contact Switching Rate:	15Hz
-Relay Operate Time	15 ms
-Relay Release Time	4 ms
-Contact Arrangements:	

3NO/7NC
8NO/2NC
9NO/1NC

-Contact Material:	AgSnO ₂ +0.2µmAu
--------------------	-----------------------------

-Mechanical Life:	10x10 ⁶ operation cycles
-Ambient Temperature:	-40° + 70°C
-Weight:	65g

Coil Specifications

Rated Voltage	Min. Pick-up	Coil Resistance
12VDC	8.4V	110Ω ± 15%
24VDC	16.8V	440Ω ± 15%

Relay Specifications - 6 Pole

-Normal Coil Voltage:	12,24 VDC
-Coil Power Dissipation:	1.3W
-Max. Switching Voltage:	250VAC
-Max. Switching Current:	

Control Contacts	6A
Output Contacts	16A

-Max. Switching Power:	
Control Contacts	1500VA
Output Contacts	4000VA

-Contact Switching Rate:	15Hz
-Relay Operate Time	18 ms
-Relay Release Time	5 ms

-Contact Arrangements:	
Control Contacts	1NO/1NC
Output Contacts	4NO

-Contact Material:	AgSnO ₂ +0.2µmAu
--------------------	-----------------------------

-Mechanical Life:	10 ⁶ x10 ⁶ operation cycles
-Ambient Temperature:	-40° + 70°C
-Weight:	60g

Coil Specifications

Rated Voltage	Min. Pick-up	Coil Resistance
12VDC	8.4V	110Ω ± 15%
24VDC	16.8V	440Ω ± 15%

CUSTOM INTERFACE MODULES

If your design or application requires more functionality or features than our standard product, Altech offers complete engineering, prototype and production services for custom modules.

Our staff has the ability to take your design or requirements and manufacture your custom module. Custom module production generally includes engineering, PCB layout and prototypes, packaged in Altech extrusions for mounting on panels or DIN Rail. In many industrial control systems, customized designs are the solution for many problems.

Altech provides a quick turnaround and competitive solution to your problem. Altech provides the following benefits to your company:

Application Assistance

- Modify a standard product
- Help define a new product

Engineering Capability

- Use of latest CAD system
- PCB layouts completed promptly
- Prototypes available two weeks after PCB layout approval

Manufacturing Capability

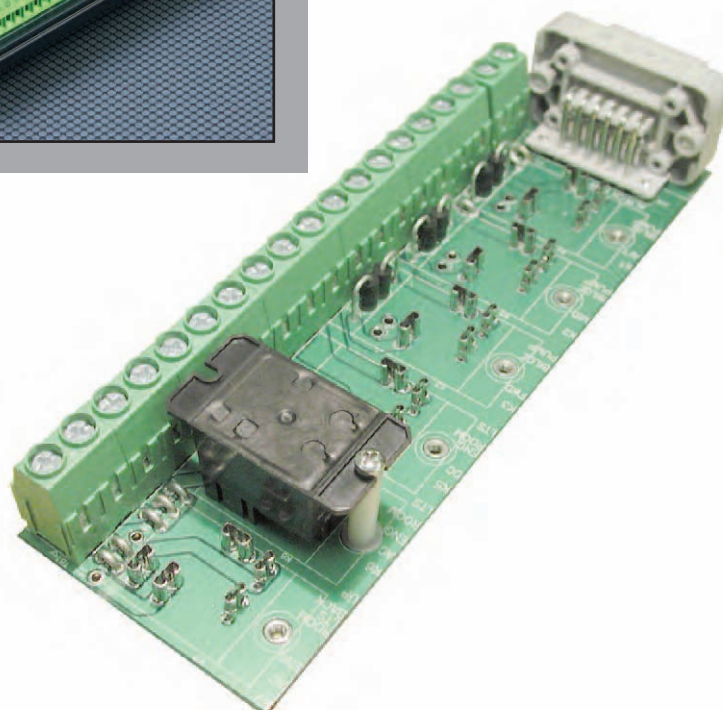
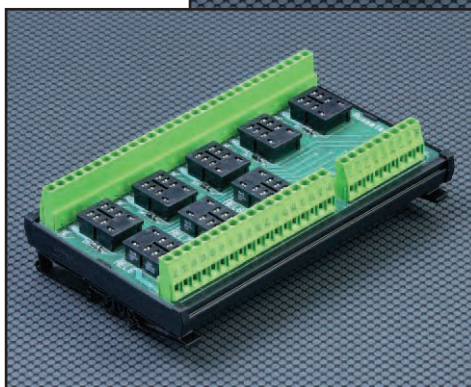
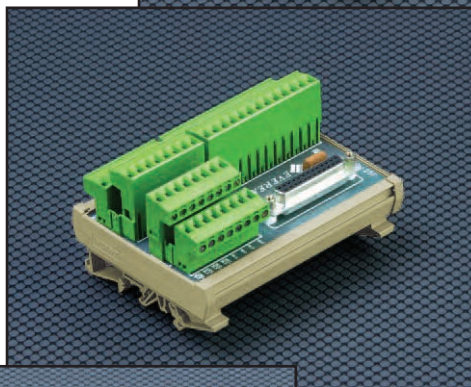
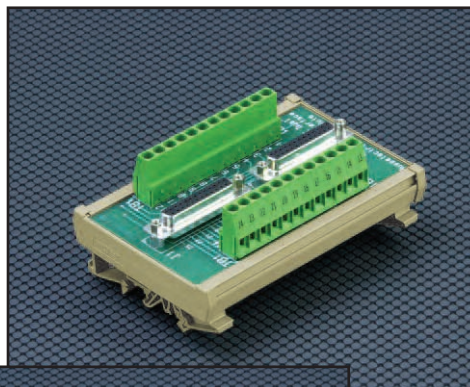
- Complete in-house manufacturing
- ISO 9001 Certified

Minimum Quantities

- 25 piece minimum for custom quotes
- Quotation provided at no cost

Altech Benefits

- Fast turnaround due to in-house capability
- Highly competitive in-house manufacturing
- Use of Altech components (blocks, extrusions, connectors)



- AC or DC coil
- I-Series direct DIN-Rail mountable with screw terminals for PLC applications
- M, G, L plug-in relays for DIN-Panel mountable sockets, with lockable test buttons and mechanical flag (M and G)
- LED version available
- Diode module for M-Series and G-Series available

Contact Specifications

Contact Configurations	SPDT	SPDT	SPDT
Rated Current	6 A	1.2 A	500 mA
Rated Voltage	250 V AC	400 VAC	70 VAC
Rated Load	6A @ 250VAC; 6A @ 24VDC	1.2 A/ 400 VAC	500 mA/ 70 VDC
Min Switching Current	8 mA/ 24 V	8 mA	1 mA
Contact Material	AgSnO ₂	AgSnO ₂	AgSnO ₂

Coil Specifications

Rated Voltage (DC)	12, 24 V*	5...32 V	5-32 V
Rated Voltage (AC)	24, 110, 230	24-230 V	24-230 V
Power Consumption	0.3-0.6W @ 12/24V 1.8VA @ 230VAC	0.3 W 5...32 VDC @ 24V 0.3 W 24 VAC/DC	0.3 W 5...32 VDC @ 24V 0.3 W 24 VAC/DC
	1W/VA @ 230VAC/DC	1.6 W 230 V AC/DC	1.0 W 230 V AC/DC

General Data

Mechanical Life Cycles	2 x 10 ⁷	2 x 10 ⁷	2 x 10 ⁷
Electrical Life Cycles	10 ⁵	10 ⁵	10 ⁵
Operate/Release Time (ms)	7(AC) 6(DC) / 15(AC) 8(DC)	10/10	10/10
Insulation Between Coil & Contacts	4kV	4kV	3kV
Insulation Between Open Contact	1kV	600 VAC	600 VAC
Ambient Temperature Range	-40 to 55°C	-40 to 55°C	-40 to 55°C

Accessories

Jumper Links, 20 pole (red, black, blue)	I1C-20RD	I1C-20BK	I1C-20BL
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Ordering Codes	I1-L Series
	I 1 L [] [] [] [] R
Coil Codes	
D012	= 12VDC
D024	= 24VDC
A230	= 230VAC
U024	= 24VAC/DC
U110	= 110VAC/DC
U230	= 230VAC/DC
Other coil voltages on request.	

Ordering Codes	I1-T Series
	I 1 T [] [] [] [] R
Coil Codes	
D032	= 5...32VDC
U024	= 24VAV/DC
U230	= 230VAC/DC
Other coil voltages on request.	

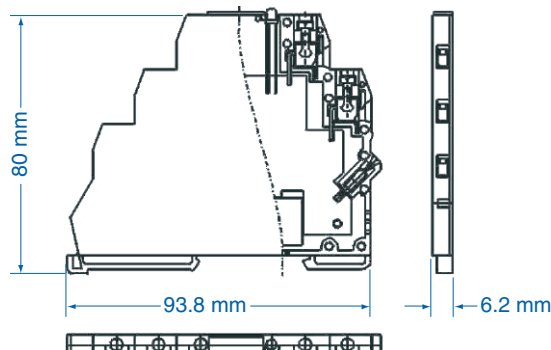
Ordering Codes	I1-OC Series
	I 1 O C [] [] [] [] R
Coil Codes	
D032	= 5...32VDC
U024	= 24VAV/DC
U230	= 230VAC/DC
Other coil voltages on request.	

Dimensions

All dimensions are in millimeters.
To convert to inches, divide by 25.4.

Wiring Diagram: (page 28)

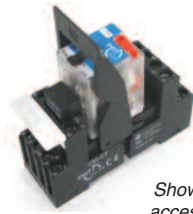
* 24VAC/DC, 110VAC/DC,
230VAC/DC combination also available



I1C-RD (red)
I1C-BK (black)
I1C-20BL (blue)

Shown with
jumper accessory.

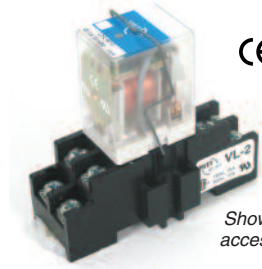
M-Series



Shown with accessories.



L-Series



Shown with accessories.



Contact Specifications

Contact Configurations	DPDT; 4PDT	DPDT
Rated Current	5A	12A
Rated Voltage	250VAC	250VAC
Rated Load	5A @ 250VAC; 5A @ 24VDC	12A @ 250VAC; 12A @ 24VDC
Min Switching Current	300mW	300mW
Contact Material	AgNi	AgCd0

Coil Specifications

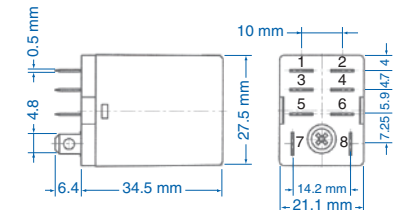
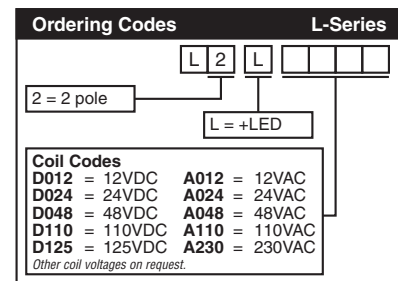
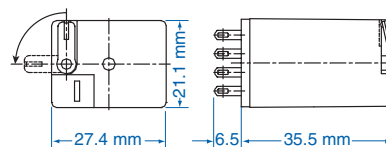
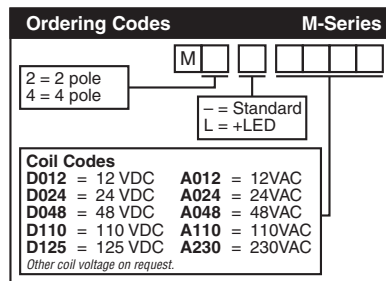
Rated Voltage (DC)	12, 24, 48, 110, 125	12, 24, 48, 110, 125
Rated Voltage (AC)	12, 24, 48, 110, 230	12, 24, 48, 110, 230
Power Consumption	0.9W (DC)	1.1W (DC)
	1.9VA @ 50Hz	1.6VA @ 50Hz
	1.6VA @ 60Hz	1.9VA @ 60Hz

General Data

Mechanical Life Cycles	2 x 10 ⁷	2 x 10 ⁷
Electrical Life Cycles	10 ⁵	10 ⁵
Operate/Release Time (ms)	10(AC) 13(DC) / 8(AC) 3(DC)	15(AC/DC) / 10(AC/DC)
Insulation Between Coil & Contacts	2kV	2kV
Insulation Between Open Contact	1kV	0.75kV
Ambient Temperature Range	-40 to 70°C	-40 to 55°C

Dimensions

All dimensions are in millimeters.
To convert to inches, divide by 25.4.



Accessories

Socket	VM-4T	VL-2
Retaining Clip	CM-1/MS35	CL-1
Diode Module	DM-1	-
Jumper Links, 20 pole (red, black, blue)	-	-

* 24VAC/DC, 110VAC/DC,
230VAC/DC combination also available

G-Series

Wiring Diagrams



Shown with
accessories.

Contact Specifications

Contact Configurations	DPDT; 3PDT
Rated Current	10A
Rated Voltage	250VAC
Rated Load	10A @ 250VAC; 10A @ 24VDC
Min Switching Current	300mW
Contact Material	AgNi

Coil Specifications

Rated Voltage (DC)	12, 24, 48, 110, 120
Rated Voltage (AC)	12, 24, 48, 110, 230
Power Consumption	1.5W (DC)
	2.5VA @ 50Hz
	2.8VA @ 60Hz

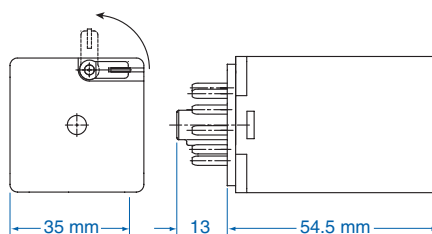
General Data

Mechanical Life Cycles	2×10^7
Electrical Life Cycles	2×10^5
Operate/Release Time (ms)	12(AC) 18(DC) / 12(AC) 7(DC)
Insulation Between Coil & Contacts	2.5kV
Insulation Between Open Contact	1.5kV
Ambient Temperature Range	-40 to 70°C

Dimensions

All dimensions are in millimeters.
To convert to inches, divide by 25.4.

Ordering Codes	
G-Series	G
08 = 2 pole	
11 = 3 pole	
- = Standard	
L = +LED	
Coil Codes	
D012 = 12VDC	A012 = 12VAC
D024 = 24VDC	A024 = 24VAC
D048 = 48VDC	A048 = 48VAC
D110 = 110VDC	A110 = 110VAC
D125 = 125VDC	A230 = 230VAC
Other coil voltages on request.	

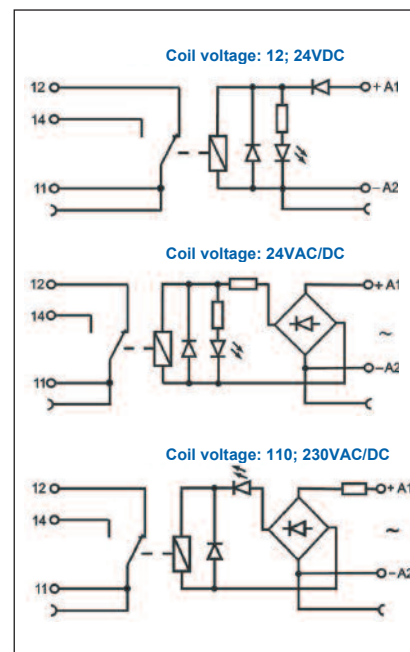


Accessories

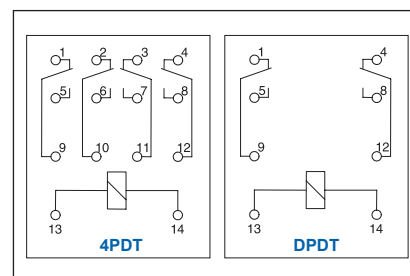
Socket	8p: VG-8T; 11p: VG-11T
Retaining Clip	CG-1
Diode Module	-
Jumper Links, 20 pole (red, black, blue)	-

* 24VAC/DC, 110VAC/DC,
230VAC/DC combination also available

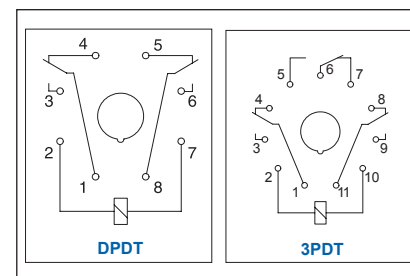
I1-Series



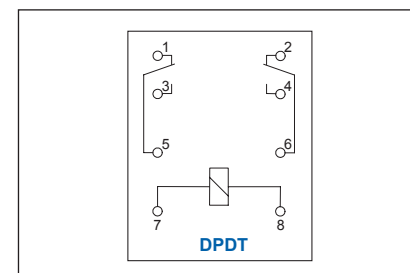
M-Series



G-Series



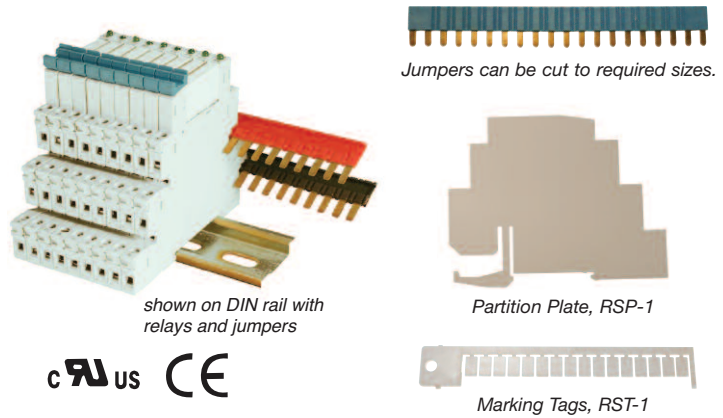
L-Series



RS Series Relay Modules

At only 6.2mm thickness the RS series Relay module features a slim Din Rail mountable interface solution. The modules have a plug in construction and are available with or without the relay. The built in LED indicates the relay energizing state. The relay features a SPDT configuration and a maximum switching current of 6A. It is available with several standard coil voltages from 5VAC/DC up to 230V AC/DC.

There is a provision for fitting pluggable jumpers which reduces the wiring time. The modules have screw terminals with finger protection for wire termination and offer an IP 20 protection rating. The relay has an IP67 protection rating. Both the relay and the module are UL recognized.

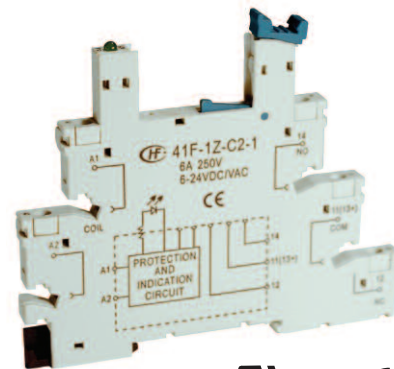


Part Number	Type number	Description	Std. Pk.
RSM-05CU	41F-1Z-C2-5 + HF41F/5-Z-S	6A@250VAC/30VDC,5VDC Coil, 6.2 mm, LED, SPDT	10
RSM-06CU	41F-1Z-C2-5 + HF41F/6-Z-S	6A@250VAC/30VDC,6VDC Coil, 6.2 mm, LED, SPDT	10
RSM-12CU	41F-1Z-C2-1 + HF41F/12-Z-S	6A@250VAC/30VDC,12VAC/DC Coil, 6.2 mm, LED, SPDT	10
RSM-24CU	41F-1Z-C2-1 + HF41F/24-Z-S	6A@250VAC/30VDC,24VAC/DC Coil, 6.2 mm, LED, SPDT	10
RSM-110CU	41F-1Z-C2-3 + HF41F/60-Z-S	6A@250VAC/30VDC,110VAC/DC Coil, 6.2mm, LED, SPDT	10
RSM-220CU	41F-1Z-C2-4 + HF41F/60-Z-S	6A@250VAC/30VDC,220VAC/DC Coil, 6.2mm, LED, SPDT	10
RSJ-RD	HF41F-AAJ-001-RD	Jumper for RSM, Red, 36A, 250V, 20 pole	10
RSJ-BK	HF41F-AAJ-001-BK	Jumper for RSM, Black, 36A, 250V, 20 pole	10
RSJ-BL	HF41F-AAJ-001-BL	Jumper for RSM, Blue, 36A, 250V, 20 pole	10
RSP-1	HF41F-AAS-001	Partition plate for RMS 2.2mm wide	10
RST-1	HF41F-AAT-001	Marking Tag strip for RSM, white, (16 tags per strip)	4

RS Series Socket

CHARACTERISTICS

Ambient Temperature:	-40°C to +70°C (-40°F to +158°F)
Rated Voltage:	250VAC
Rated Current:	6A (per pole)
Insulation Voltage (Min.):	5000VAC
Protection:	IP20
Socket Material:	PA66+GF V0 (UL)
Contacts Spring Material:	QSn6.5-0.1
Terminal Torque:	0.6Nm (5.3 lb. in.)
Wire Strip Length:	7mm
Applicable Relay Type:	RSR Series (41F)

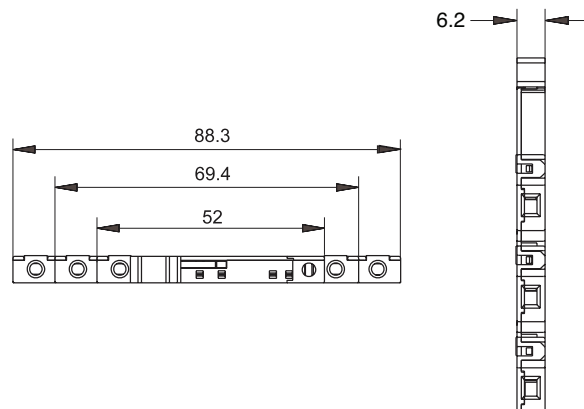
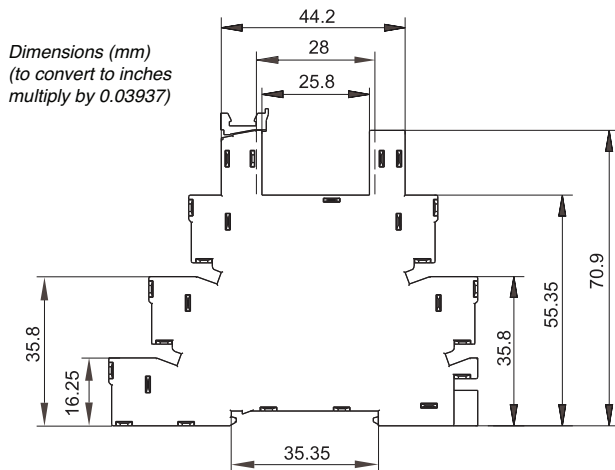


File No.: E253370

Notes: Module features/ functions:

- (1) LED indicates the coil energizing state.
- (2) Eliminates negative current of relays.
- (3) Rectifying function (only for VAC/DC types).

Part Number	Type number	Description
RSS-624U	41F-1Z-C2-1-555	For 12 to 24VAC/DC relays, IP20, LED
RSS-624D	41F-1Z-C2-5-555	For 5 to 24VDC relays, IP20, LED
RSS-4860U	41F-1Z-C2-2-555	For 48 to 60VAC/DC relays, IP20, LED
RSS-110U	41F-1Z-C2-3-555	For 110 to 125 VAC/DC relays, IP20, LED
RSS-220U	41F-1Z-C2-4-555	For 220 to 240 VAC/DC relays, IP20, LED



RS Series Subminiature Power Relay

FEATURES

- Slim size (width 5mm)
- High breakdown voltage 4kV (between coil and contacts)
- Surge voltage up to 6kV (between coil and contacts)
- Clearance/creepage distance: 8mm
- Coil power consumption: 170mW
- Contact configuration: SPDT (Form C)
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 28.0 x 5.0 x 15.0mm



cULus
File No.:E133481



File No.:40020043

CONTACT INFORMATION

Contact arrangement	SPDT	
Initial contact Resistance Max.	100mΩ (at 1A/6VDC) Gold plated: 30mΩ (at 1A/6VDC)	
Contact material	AgNi	
Contact rating	Resistive Load	6A/250VAC
	Pilot Duty	6A/30VDC
Max. switching voltage	400VAC / 125VDC	
Max. switching current	6A resistive	
Max. switching power	1500VA / 180W	
Mechanical life	10 million cycles	
Electrical life	10,000 cycles at 85°C (185°F)	

CHARACTERISTICS

Initial insulation resistance	1000mΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	4000VAC 1 min.
	Between open contacts	1000VAC 1 min.
Operate time (at nominal voltage)	Max. 8ms	
Release time (at nominal voltage)	Max. 4ms	
Shock resistance	Functional	50m/s ² (5g)
	Destructive	1000m/s ² (100g)
Vibration resistance	1mm double amplitude max @10 ...55 Hz, 6G max	
Humidity	5 to 85% RH	
Ambient temperature	-40°C to +85°C (-40°F to +185°F)	
Termination	Plug in; PCB mount	
Unit weight	5.4g (0.2 oz.)	
Construction	Sealed IP67. Flux proof	

COIL

Coil power consumption:	5 to 24VDC: 170mW 48VDC, 60VDC: 210mW
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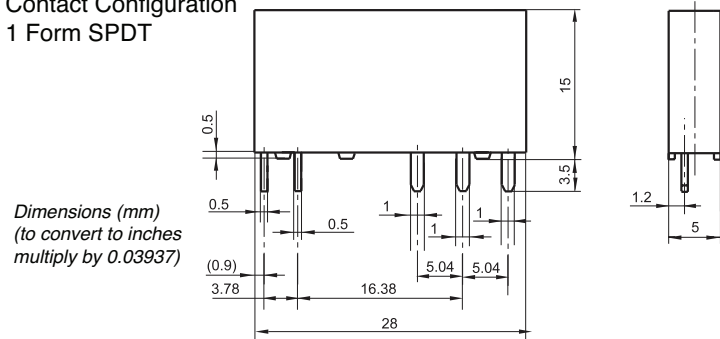
COIL DATA

at 20°C

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max. Allowable Voltage (VDC) 85°C	Coil Resistance (Ω)
5	3.75	0.25	6.50	147 ± 10%
6	4.50	0.30	7.80	212 ± 10%
12	9.00	0.60	15.6	848 ± 10%
24	18.0	1.20	31.2	3390 ± 15%
48	36.0	2.40	62.4	10600 ± 15%
60	45.0	3.00	78.0	16600 ± 15%

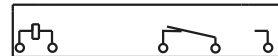
Part Number	Type number	Description
RSR-05DCS	HF41F/5-Z-S-210	SPDT, 5 mm, 5VDC Coil, IP67
RSR-06DCS	HF41F/6-Z-S-210	SPDT, 5 mm, 6VDC Coil, IP67
RSR-12DCS	HF41F/12-Z-S-210	SPDT, 5 mm, 12VDC Coil, IP67
RSR-24DCS	HF41F/24-Z-S-210	SPDT, 5 mm, 24VDC Coil, IP67
RSR-48DCS	HF41F/48-Z-S-210	SPDT, 5 mm, 48VDC Coil, IP67
RSR-60DCS	HF41F/60-Z-S-210	SPDT, 5 mm, 60VDC Coil, IP67

Contact Configuration
1 Form SPDT

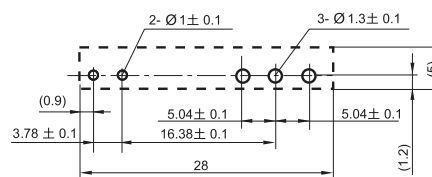


Dimensions (mm)
(to convert to inches
multiply by 0.03937)

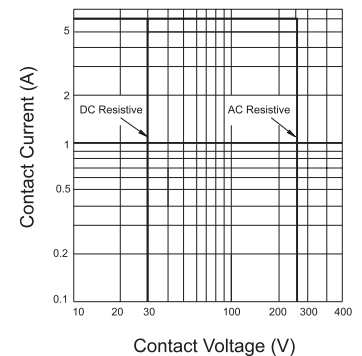
Wiring Diagram



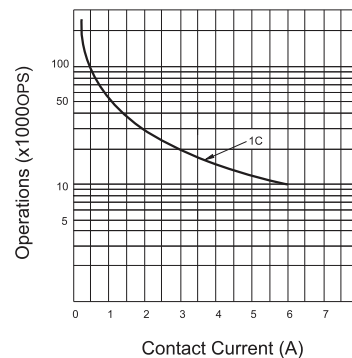
PCB Layout



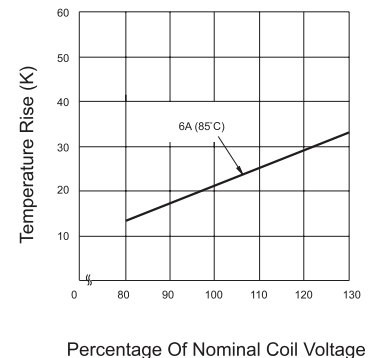
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



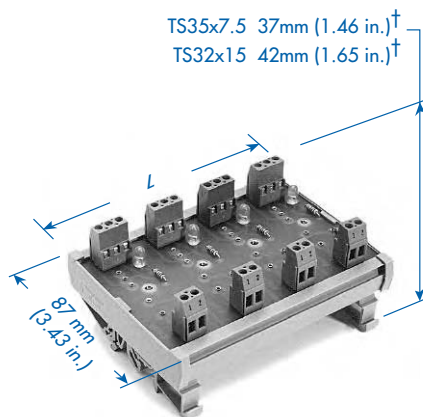
INTERFACES

I/O Opto Carrier
35 or 32mm DIN Rail

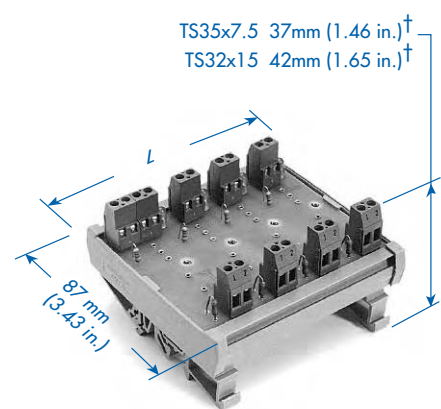
Mount standard opto coupler input/output (I/O) modules in a high density arrangement for logic output to field devices, or for input of field data to the controller. I/O modules optically isolate ICs and PLCs from damaging field voltage spikes and line noise, while controlling up to 3 Amp field current with less than 20mA logic current. Altech I/O Module Carriers can accept up to 16 industry standard 0.6 in. (15.24mm) I/O modules in any combination: Input, Output, AC or DC from most manufacturers.

- Screw-Cage Clamp Connection
- Integral Sockets, Retaining Nut
- Field Voltage Rating: 280V AC/DC^a
- LED Indication, Fuse Protection
- DIN Rail Mount, Panel Mount Available

Custom designs can be accommodated!

I/O I
Isolated

Low current LED with dropping resistor for high resistance pull-up and low logic sink/source current requirements.

I/O B
Bussed

Logic status LED which uses the I/O module impedance as its dropping resistor.

Wire Range	Fuse Rating
22-12AWG	0.5-4mm ² 5A/125V AC ^b

Wire Range	Fuse Rating
22-12AWG	0.5-4mm ² 5A/125V AC ^c

Ordering Information	LED	Type	Cat. No.	Length (L) mm (in.)	Type	Cat. No.	Length (L) mm (in.)
I/O Opto Carrier, Isolated Positions							
1 Position, Logic Voltage							
5V DC	Green	I/O I-1B	8954.0/B	34.5 (1.36)			
15V DC	Yellow	I/O I-1E	8954.0/E	34.5 (1.36)			
24V DC	Red	I/O I-1G	8954.0/G	34.5 (1.36)			
2 Position, Logic Voltage							
5V DC	Green	I/O I-2B	8955.0/B	57.8 (2.28)			
15V DC	Yellow	I/O I-2E	8955.0/E	57.8 (2.28)			
24V DC	Red	I/O I-2G	8955.0/G	57.8 (2.28)			
4 Position, Logic Voltage							
5V DC	Green	I/O I-4B	8956.0/B	114 (4.49)			
15V DC	Yellow	I/O I-4E	8956.0/E	114 (4.49)			
24V DC	Red	I/O I-4G	8956.0/G	114 (4.49)			
8 Position, Logic Voltage							
5V DC	Green	I/O I-8B	8957.0/B	226 (8.90)			
12V DC	Yellow	I/O I-8E	8957.0/E	226 (8.90)			
24V DC	Red	I/O I-8G	8957.0/G	226 (8.90)			

I/O Opto Carrier
Bussed Positions

4 Position, Logic Voltage 5 to 24V DC		Green		I/O B-4	8956.0	114 (4.49)
8 Position, Logic Voltage 5 to 24V DC		Green		I/O B-8	8959.0	183 (7.20)
16 Position, Logic Voltage 5 to 24V DC		Green		I/O B-16	8861.0	363 (14.30)

Std. Pk.: 1

†Dimension is to top board, add height of relay to determine clearance.

^b3A/250V fuse available, please consult Altech.

Std. Pk.: 1

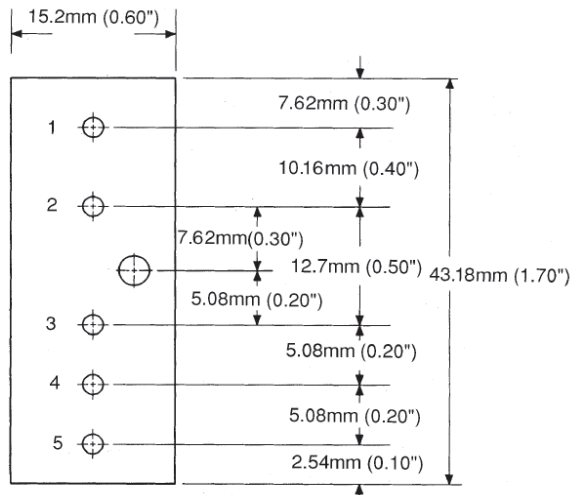
†Dimension is to top board, add height of relay to determine clearance.

^c3A/250V fuse available, please consult Altech.

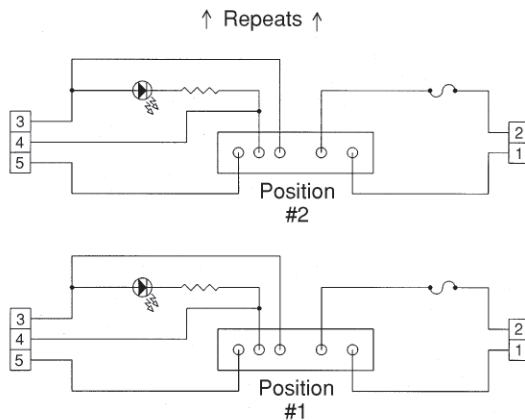
^aFuse rating limits field side rating.

- PCB Traces, Field Side : 10A/300V
- PCB Traces, Logic Side: 1A with 6A Bus
- Terminal Blocks: 15A/300V

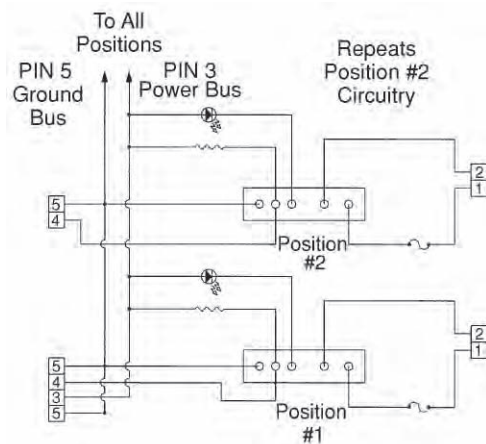
Standard Pinout



I/O I Isolated Positions



I/O B Bussed Positions



Standard Pinout

The I/O Module pin utilization information listed below is intended for use only as a guide. For specific applications, please use only the module manufacturer's published specifications.

Pins 1 & 2: Field Connections

- AC Output to field load, inductive up to 3.5A at nominal 24V AC, 120V AC or 240V AC. AC hot to either pin, field load on other pin.
- DC Output to field load (inductive OK with commutating diode). Some modules polarized with pin #1 positive (+). Standard output voltages 60V DC (5-60), 200V DC (10-200).
- AC Input of field data to the logic, 10mA max at nominal 24V AC (18-36), 120V AC (90-140) and 240V AC (90-280). Field signal to either pin.
- DC Input of field data to the logic, some modules dual rated AC/DC, other nominal 5-28V DC (min. 4, max. 32), and nominal 12-48V DC (min. 10, max. 60). Some modules polarized with pin #1 (+).

Pin 3: VCC Logic Power

- Standard modules are available in three nominal logic voltages: 5V DC (normally min. 3 to max. 6), 15V DC (12 to 18) and 24V DC (20 to 30).

Pin 4: Logic Signal

- Output - Logic ground (sink) on pin #4 closes output circuit (pin #1 to pin #2 normally open, shorts with sink on input pin #4). A few positive-logic modules are available.
- Input - Field signal to pins #1 and #2 gives 20-25mA sink at pin #4 (to pin #5).

Pin 5: Logic Ground

- On input modules only (no pin #5 on output modules).

Solid State Relay I/O Modules 35 or 32mm DIN Rail

Solid State I/O Modules are used to switch both AC and DC loads as well as sensing AC or DC control voltages for controlling the input to a PLC. The input is isolated from the output via an optically coupled circuit in the device itself. Since there are no moving parts, the device will have a virtually unlimited life.

Altech I/O Module assemblies can be supplied in either an isolated or bussed configuration as shown on page 28.

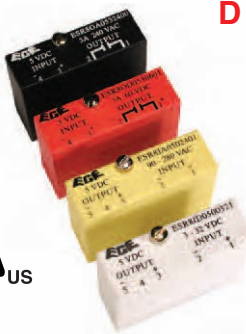
Features:

- Wide range of Solid State I/O Modules to choose from
- LED Indicators, Fuse Protection
- Input or Output Modules can be mixed & Matched on the same board
- Custom installed I/O modules available upon request
- Most plug-in modules are UL Recognized, CE mark.
- Bussed or isolated
- up to 16 channels on single module

**Custom designs can
be accommodated!**

Individual I/O Modules

- CSA-CA recognized
- UL recognized
- Optically isolated
- Industry standard package and pin-out
- 4 kV isolation

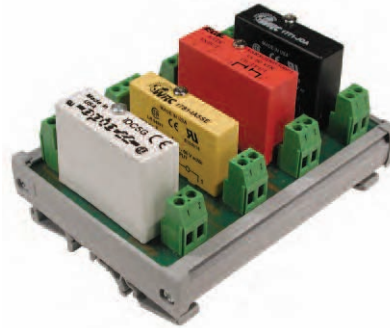


Altech offers a complete line of individual I/O modules. For complete specifications, refer to the listed module part numbers shown above.

* If all plug-in modules are of the same type, then enter the 4 digits of the specific module(s). For example, the part number of a 4 channel, bussed, standard board with the OD05 type module would be: **8950-C-1-A-OD05**.

In the case of mixed modules, please contact Altech for ordering information.

SSR I/O Series



AC Output Solid State Relays

Part No.	Nominal Input Voltage	Control Voltage Range	Input Current Typical	Output Voltage Range	Off-state Leakage Current	Max. Turn On Time	Max. Turn Off Time	Output Current
OA05	5 VDC	2.5-6.0 VDC	10 mA	24-240 VAC	5 mA	8.3 ms (60 Hz)	8.3 ms (60 Hz)	3A
OA15	15 VDC	8.5-18.5 VDC	10 mA	24-240 VAC	5 mA	8.3 ms (60 Hz)	8.3 ms (60 Hz)	3A
OA24	24 VDC	16.5-29.0 VDC	10 mA	24-240 VAC	5 mA	8.3 ms (60 Hz)	8.3 ms (60 Hz)	3A

DC Output Modules Solid State Relays

Part No.	Nominal Input Voltage	Control Voltage Range	Input Current Typical	Output Voltage Range	Off-state Leakage Current	Max. Turn On Time	Max. Turn Off Time	Output Current
OD05	5 VDC	2.5-6.0 VDC	10 mA	3 - 60 VDC	1.0 mA	50 µSec	100 µSec	3A
OD15	15 VDC	8.5-18.5 VDC	10 mA	3 - 60 VDC	1.0 mA	50 µSec	100 µSec	3A
OD24	24 VDC	16.5-29.0 VDC	10 mA	3 - 60 VDC	1.0 mA	50 µSec	100 µSec	3A

AC Input Modules Solid State Relays

Part No.	Logic Supply Voltage	Min. Turn-Off Voltage	Operating Frequency	Control Voltage Range	Off-Stat Leakage Current	Max. Turn On Time	Max. Turn Off Time
IA05	5 VDC	40 VAC	47 - 63 Hz	90 - 280 VAC	10 µA	20 ms	20 ms
IA15	15 VDC	40 VAC	47 - 63 Hz	90 - 280 VAC	10 µA	20 ms	20 ms
IA24	24 VDC	40 VAC	47 - 63 Hz	90 - 280 VAC	10 µA	20 ms	20 ms

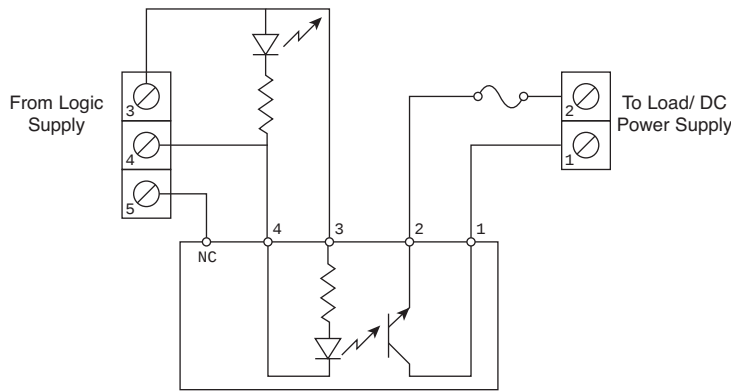
DC Input Modules Solid State Relays

Part No.	Logic Supply Voltage	Min. Turn Off Voltage	Input Resistance	Control Voltage Range	Off-Stat Leakage Current	Max. Turn On Time	Max. Turn Off Time
ID05	5 VDC	2 VDC	2.2 K Ohm	3-32 VDC	10 µA	1.0 ms	1.0 ms
ID15	15 VDC	2 VDC	2.2 K Ohm	3-32 VDC	10 µA	1.0 ms	1.0 ms
ID24	24 VDC	2 VDC	2.2 K Ohm	3-32 VDC	10 µA	1.0 ms	1.0 ms

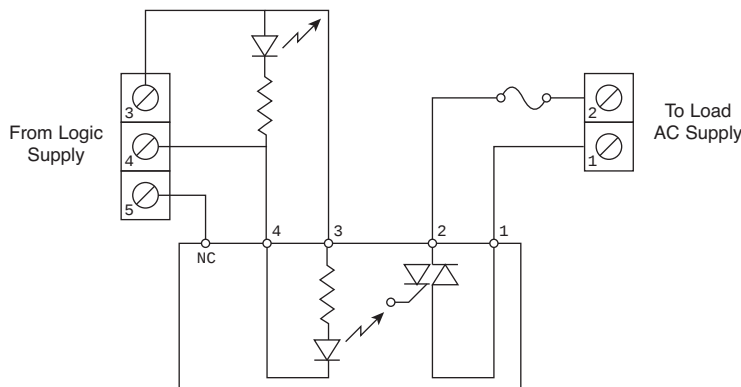
Ordering Codes

8 9 5 0									
No. of Channels		A = 1 D = 8		B = 2 E = 16		C = 4			
1 = Bussed		2 = Isolated							
Specials:		A = Standard		B = 3A, 250V Fuse					
I/O Module Type:		A = AC output		B = DC output		C = AC input		D = DC input	
						E = mixed			
Specific plug-in module(s) Part No.*									

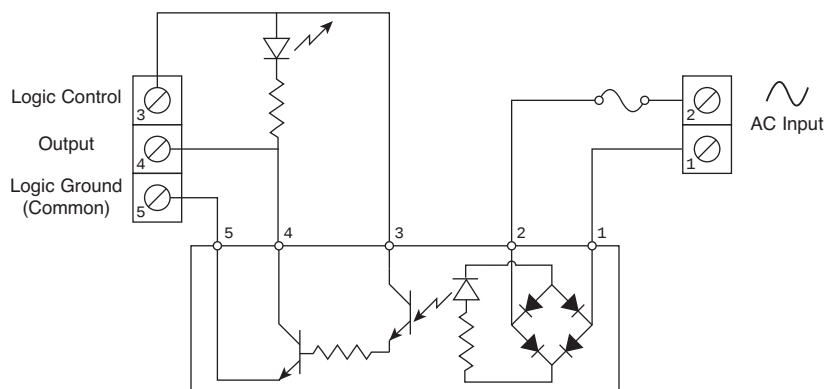
DC Output Module



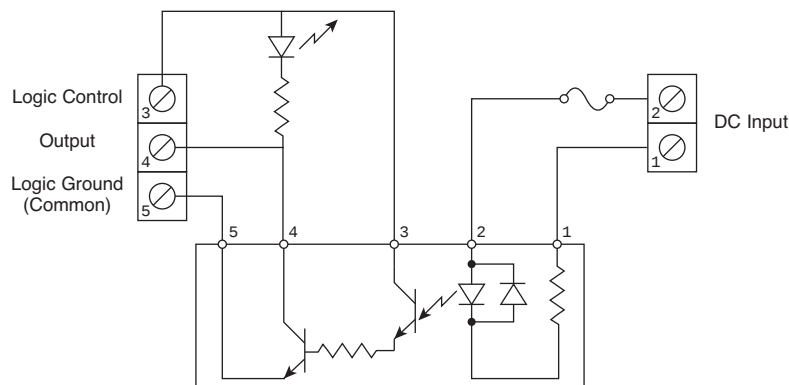
AC Output Module



AC/DC Input Module



DC Input Module



Schematic Explanations

Shown on the left are typical configurations for the I/O Solid State Relay Modules. Each plug-in module may vary somewhat, but the equivalent circuit is shown. Output Modules have only 4 connections, while the input modules have 5, with the addition of an added control voltage on pin 3.

DC Output Module

DC Output Solid State Modules usually only differ in their output rating, although some output modules respond to a different input threshold voltage. Altech offers a 3A@60 VDC output version.

AC Output Module

In choosing the appropriate AC Output Module, there are timing issues to consider as well as output voltage and current capabilities. Moreover, there is a wide variation of input resistance and voltages to consider. AC Output modules are available in either random or zero cross types. In a zero cross AC output module, the output will not switch after the application of an input voltage until the next zero crossing of the AC output waveform. This prevents a large voltage transition at the output that may generate EMI problems in other nearby sensitive circuitry. Depending on the load, the lifetime may also be dramatically increased. In the random output type, the output switches as soon as an input voltage is applied.

AC/DC Input Module

An AC Input Module will supply a logic voltage at its output with the application of an AC voltage at the input. However, it also requires a separate control voltage. The control voltage may be used to inhibit the device, hence both the control voltage and the input voltage must both be present at the same time (similar to a logical "and") in order that the module send a control signal out. Some AC input modules have a bridge rectifier at the input converting the input voltage to a DC voltage. This makes it possible to use it with DC input voltage as well. The output configuration is usually a NPN type.

DC Input Module

DC Input modules are designed to sense the presence or the absence of a DC voltage. Examples include the contact closures from sources such as push buttons, limit switches, proximity switches, etc. Like the AC Input Module, a separate control voltage can be used to inhibit the device.

Specifications

- Din Rail mount
- Wide Power Range (20W-960W)
- Wide Adjustment Range
- Rugged for Industrial Use
- High Efficiency
- Short circuit Protection
- Over-voltage Protection
- Overload Protection
- Over-temperature Protection
- Lightweight and compact Design

Input

- Input Voltage
 - 85-264 VAC for the single phase
 - 340-550 VAC for the three phase
- Input Frequency: 47-63 Hz
- Input Current: 0.55 A to 8A
- Inrush Current: 60 A max
- Power Factor: All units EN61000-3-2 compliant

Output

- Output Voltage: 5V; 12V; 15V; 24V; 48V
- Output Voltage Adjustment Range: $\pm 10\%$
- Initial Set Accuracy: $\pm 2\%$ max
- Ripple & Noise: See data sheet
- Over-voltage Protection: 115-135%
- Overload Protection: 105-150%, constant current with auto recovery

General

- Efficiency: 72-92% (see data sheets)
- Isolation: 3000 VAC Input to Output
1500 VAC Input to Ground
500 VAC Output to Ground



Environmental

Power supplies can run at 100% capacity inside the panel, there is no need for oversizing. See derating curves for more information. (at altechcorp.com)

- Operating Temperature:
-20~ +60°C
- Operating Humidity:
90% RH, non-condensing
- Storage Temperature:
-20 °C to +85 °C
- Vibration: 2 G, 10 Hz to 500 kHz,
10 min/cycle for 60 minutes
each axis

EMC & Safety

- Emissions: EN55022/55011,
Class B
- EN61000-3-2, 3
- Voltage Flicker: EN61000-3-3
- ESD Immunity: EN61000-4-2,
level 3 air
- Radiated Immunity:
EN61000-4-3, 10 V/m
- EFT/Burst: EN61000-4-4,
level 3
- Surge: EN61000-4-5, level 3
- Conducted Immunity:
EN61000-4-6, 10 V rms,
- Safety Approvals:
EN60950, UL508,
UL60950 on 120, 240, 480 &
960 W models,
CE marked



20-100W Single Phase Slimline Power Supplies

Key Features

- Universal AC Input / Full Range
- NEC class 2 / LPS compliant (Only selected models; see data sheet at altechcorp.com)
- LED indicator for power on
- 100% full load burn-in test
- 3 year warranty
- Input voltage range: 85-264V AC, 120-370V DC
- AC inrush current (typical):
Cold start: 20A at 115V AC, 40A at 230V DC
- DC adjustment range (typical): $\pm 10\%$ rated output voltage
- Overload protection (typical):
105%-160% constant current limiting, auto-recovery
- Over-voltage protection (typical):
115%-135% rated output voltage
- Setup, rise, time (typical):
500ms, 30ms/230V AC
1000ms, 30ms/115V AC, at full load
- Withstand voltage:
I/P-O/P: 3KV AC, I/P-FG: 1.5KV AC, O/P-FG: 0.5KV AC,
- Working temperature:
-20 to +70°C (-4° to +158°F), refer to output derating curve
- Safety standards:
UL508, EN60950-1*
- EMC standards:
EN55022 class B, EN61000-4-2,3,4,5,6,8,11,
ENV50204, EN55024, EN61000-6-1,
EN61204-3 Light Industry Level**, criteria A

* Except PS-S20xx. ** Heavy for PS-S40xx and PS-S60xx

20W Single Output Industrial



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PS-S2005	5V DC	3A	$\pm 2\%$	80 mVp-p	76%
PS-S2012	12V DC	1.67A	$\pm 1\%$	120 mVp-p	80%
PS-S2015	15V DC	1.34A	$\pm 1\%$	120 mVp-p	81%
PS-S2024	24V DC	1A	$\pm 1\%$	150 mVp-p	84%

Universal Input: 85-264V AC, 120-370V DC full range;
0.55A @ 115V AC; 0.35A @ 230V AC
Connection: Input - 3 poles, Output - 2 poles screw terminal
+ DC OK active signal
Size (WxHxD): 22.5x90x100mm (0.89x3.54x3.94 inches)
Packaging: 1/box; 0.48lbs / 0.19Kg

40W Single Output Industrial



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PS-S4005	5V DC	6A	$\pm 2\%$	80 mVp-p	79%
PS-S4012	12V DC	3.33A	$\pm 1\%$	120 mVp-p	86%
PS-S4024	24V DC	1.7A	$\pm 1\%$	150 mVp-p	88%
PS-S4048	48V DC	0.83A	$\pm 1\%$	200 mVp-p	88%

Universal Input: 85-264V AC, 120-370V DC full range;
1.1A @ 115V AC, 0.7A @ 230V AC
Connection: Input - 3 poles, Output - 4 poles screw terminal
+ DC OK relay contact
Size (WxHxD): 40x90x100mm (1.57x3.54x3.94 inches)
Packaging: 1/box; 0.66lbs / 0.3Kg

60W Single Output Industrial



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PS-S6005	5V DC	10A	$\pm 2\%$	80 mVp-p	79%
PS-S6012	12V DC	5A	$\pm 1\%$	120 mVp-p	86%
PS-S6024	24V DC	2.5A	$\pm 1\%$	150 mVp-p	88%
PS-S6048	48V DC	1.25A	$\pm 1\%$	200 mVp-p	89%

Universal Input: 85-264V AC, 120-370V DC full range;
1.8A @ 115V AC, 1A @ 230V AC
Connection: Input - 3 poles, Output - 4 poles screw terminal
+ DC OK relay contact
Size (WxHxD): 40x90x100mm (1.57x3.54x3.94 inches)
Packaging: 1/box; 0.73lbs / 0.33Kg

100W Single Output Industrial



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PS-S10012	12V DC	8A	$\pm 1\%$	120 mVp-p	87%
PS-S10024	24V DC	4A	$\pm 1\%$	150 mVp-p	88%
PS-S10048	48V DC	2A	$\pm 1\%$	200 mVp-p	87%

Connection: Input - 2 poles, Output - 4 poles screw terminal
Size (WxHxD): 55x90x100mm (2.17x3.54x3.94 inches)
Packaging: 1/box; 0.73lbs / 0.33Kg

30-60W Single Phase Low Profile Power Supplies

Key Features

- Cooling by free air convection
- Universal AC Input / Full Range
- LED indicator for power on
- 100% full load burn-in test
- 3 year warranty
- Input voltage range: 85-264V AC, 120-370V DC
- AC inrush current (only PS-30xx):
Cold start: 15A at 115V AC, 30A at 230V DC
- DC adjustment range:*
±10% rated output voltage
- Overload protection:*
105%-160% constant current limiting, auto-recovery
- Over-voltage protection:*
115%-135% rated output voltage

- Setup, rise, hold up time:*
100ms, 30ms, 60ms at full load and 230V AC
- Withstand voltage:
I/P-O/P:3KV AC, I/P-FG:1.5KV AC*
- Working temperature:
-20 to +50°C (-4° to +122°F) at 100%, and +60°C (+140°F) at 80% load
- Safety standards:
UL60950-1, UL508*
- EMC standards:
EN55022 class B*, EN61000-4-2,3,4,5,6,8,11
ENV50204, EN61204-3
- Military Standard: MIL-HDBK-217F

* Except PS-100xx (see data sheet at altechcorp.com)

30W Single Output Class II



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PS-3005	5V DC	3A	±2%	80 mVp-p	74%
PS-3012	12V DC	2A	±1%	120 mVp-p	81%
PS-3015	15V DC	2A	±1%	120 mVp-p	82%
PS-3024	24V DC	1.5A	±1%	150 mVp-p	83%

Universal Input: 85-264V AC, 120-370V DC full range;
0.88A @ 115V AC; 0.48A @ 230V AC
Connection: Input - 2 poles, Output - 4 poles screw terminal
Size (WxHxD): 78x93x56mm (3.07x3.66x2.05 inches)
Packaging: 1/box; 0.59lbs / 0.27Kg

60W Single Output Class II



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PS-6005	5V DC	6.5A	±2%	80 mVp-p	76%
PS-6012	12V DC	4.5A	±1%	120 mVp-p	82%
PS-6015	15V DC	4.0A	±1%	120 mVp-p	83%
PS-6024	24V DC	2.5A	±1%	150 mVp-p	84%

Universal Input: 88-264V AC, 124-370V DC full range;
1.2A @ 115V AC, 0.8A @ 230V AC
Connection: Input - 2 poles, Output - 4 poles screw terminal
Size (WxHxD): 78x93x56mm (3.07x3.66x2.05 inches)
Packaging: 1/box; 0.66lbs / 0.3Kg

45W Single Output Class II



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PS-4505	5V DC	5A	±2%	100 mVp-p	72%
PS-4512	12V DC	3.5A	±1%	200 mVp-p	77%
PS-4515	15V DC	2.8A	±1%	240 mVp-p	77%
PS-4524	24V DC	2A	±1%	480 mVp-p	80%

Universal Input: 85-264V AC, 120-370V DC full range;
1.5A @ 115V AC, 0.75A @ 230V AC
Connection: Input - 3 poles, Output - 4 poles screw terminal
Size (WxHxD): 78x93x67mm (3.07x3.66x2.64 inches)
Packaging: 1/box; 0.69lbs / 0.31Kg

100W Single Output Class II



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PS-10012	12V DC	6.5A	±2%	120 mVp-p	87%
PS-10015	15V DC	4.5A	±1%	120 mVp-p	87%
PS-10024	24V DC	4.0A	±1%	120 mVp-p	89%

Universal Input: 88-264V AC, 124-370V DC full range;
3A @ 115V AC, 1.6A @ 230V AC
Connection: Input - 2 poles, Output - 4 poles screw terminal
Size (WxHxD): 100x93x56mm (3.93x3.66x2.05 inches)
Packaging: 1/box; 0.77lbs / 0.35Kg

75-240W Single Phase Low Profile Power Supplies

Key Features

- Universal AC Input / Full Range or switch select
- LED indicator for power on
- 100% full load burn-in test
- 3 year warranty
- Input voltage range: * 85-264V AC, 120-370V DC
- AC inrush current:
Cold start: 20A at 115V AC, 40A at 230V AC
- DC adjustment range:
±10% rated output voltage
- Overload voltage protection:
105%-160% constant current limiting, auto-recovery
- Over-voltage protection:
115%-135% rated output voltage
- Setup, rise, hold up time:
500ms; 70ms; 30ms at full load and 230V AC
- Withstand voltage:
I/P-O/P: 3KV AC, I/P-FG: 1.5KV AC, O/P-PG: 0.5KV AC
- Working temperature:
-20 to +50°C (-4° to +122°F) at 100%,
and +60°C (+140°F) at 80% load
- Safety standards:
UL60950-1, UL508
- EMC standards:
EN55022 class B, EN61000-4-2,3,4,5,6,8,11,
ENV50204, EN61204-3
- Military Standard: MIL-HDBK-217F

* Except PSH-120xx (see data sheet at altechcorp.com)

75W Single Output



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PS-7512	12V DC	6.3A	±2%	100 mVp-p	76%
PS-7524	24V DC	3.2A	±1%	150 mVp-p	80%
PS-7548	48V DC	1.6A	±1%	240 mVp-p	81%

Universal Input: 85-264V AC, 120-370V DC full range,
1.6A @ 115V AC, 0.96A @ 230V AC

Connection: Input - 3 poles, Output - 4 poles screw terminal

Size (WxHxD): 55.5x125x100mm (2.20x4.95x3.95 inches)

Packaging: 1/box; 1.35lbs / 0.60Kg

120W Single Output



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PS-12012	12V DC	10A	±2%	80 mVp-p	80%
PS-12024	24V DC	5A	±1%	80 mVp-p	84%
PS-12048	48V DC	2.5A	±1%	100 mVp-p	85%

Switch select Input: 88-132V AC / 176-264 V AC, 248-370V DC range,
2.6A @ 115V AC, 1.6A @ 230V AC

Connection: Input - 3 poles, Output - 4 poles screw terminal

Size (WxHxD): 65.5x125x100mm (2.56x4.95x3.95 inches)

Packaging: 1/box; 1.75lbs / 0.79Kg

120W High Input Single Output



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PSH-12024	24V DC	5A	±1%	80 mVp-p	85%
PSH-12048	48V DC	2.5A	±1%	80 mVp-p	86%

Switch select Input: 340-550V AC, 480-780V DC range,
0.65A @ 400V AC, 0.6A @ 500V AC

Connection: Input - 3 poles, Output - 4 poles screw terminal

Size (WxHxD): 65.5x125x100mm (2.56x4.95x3.95 inches)

Packaging: 1/box; 1.65lbs / 0.75Kg

240W Single Output with PFC Function



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PSP-24024	24V DC	10A	±1%	80 mVp-p	84%
PSP-24048	48V DC	5A	±1%	150 mVp-p	85%

Universal Input: 85-264V AC, 120-370V DC full range,
2.8A @ 115V AC, 1.4A @ 230V AC

Built in active Power Factor Correction function. PF>0.95

Connection: Input - 3 poles, Output - 4 poles screw terminal

Size (WxHxD): 125x125x100mm (4.95x4.95x3.95 inches)

Packaging: 1/box; 2.7lbs / 1.2Kg

480W Single Phase Power Supplies

Key Features

- Universal AC Input / Full Range or switch select
- LED indicator for power on
- 100% full load burn-in test
- 3 year warranty
- Input voltage range: 90-264V AC, 250-370V DC
- AC inrush current:
Cold start: 27A at 115V AC, 45A at 230V AC
- DC adjustment range: $\pm 10\%$ rated output voltage
- Overload voltage protection:
105%-160% constant current limiting, auto-recovery
- Over-voltage protection: 115%-135% rated output voltage
- Setup, rise, hold up time: 1200ms; 40ms; 20ms at full load at 115V AC and 230V AC
- Withstand voltage:
I/P-O/P: 3KV AC, I/P-FG: 1.5KV AC, O/P-PG: 0.5KV AC
- Working temperature:
-20 to +50°C (-4° to +122°F) at 100%,
and +60°C (+140°F) at 80% load
- Safety standards:
UL60950-1, UL508
- EMC standards:
EN55022 class B, EN61000-4-2,3,4,5,6,8,11,
ENV50204,
EN61204-3
- Military Standard: MIL-HDBK-217F

* Except PS-100xx (see data sheet at altechcorp.com)

480W Single Output with PFC Function



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PSP-48024	24V DC	20A	$\pm 1\%$	120 mVp-p	89%
PSP-48048	48V DC	10A	$\pm 1\%$	120 mVp-p	89%

Wide range Input: **180-264V AC only**, 250-370V DC, 4A @ 230V AC
 Built in passive Power Factor Correction function compliance to EN61000-3-2, PF>0.7
 Connection: Input - 3 poles, Output - 4 poles screw terminal
 Size (WxHxD): 227x125x100mm (8.95x4.95x3.95 inches)
 Packaging: 1/box; 5.3lbs / 2.4Kg

480W Switch Select Single Output with PFC Function



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PSP-480S24	24V DC	20A	$\pm 1\%$	120 mVp-p	89%
PSP-480S48	48V DC	10A	$\pm 1\%$	120 mVp-p	89%

Switch select Input: 90-132V AC / 180-264 V AC, 254-370V DC range
 8A @ 115V AC, 3.2A @ 230V AC
 Built in passive Power Factor Correction function compliance to EN61000-3-2, PF>0.7/230V AC only
 Connection: Input - 3 poles, Output - 4 poles screw terminal
 Size (WxHxD): 227x125x100mm (8.95x4.95x3.95 inches)
 Packaging: 1/box; 5.8lbs / 2.6Kg

240-960W Three Phase Power Supplies

Key Features

- Three Phase Input
- LED indicator for power on
- 100% full load burn-in test
- 3 year warranty
- Input voltage range: 340-550V AC, 480-760V DC
- AC inrush current: Cold start: 50A
- DC adjustment range: $\pm 10\%$ rated output voltage
- Overload voltage protection: 105%-150% constant current limiting, auto-recovery
- Over-voltage protection: 115%-135% rated output voltage
- Setup, rise, hold up time: 1200ms, 40ms, 20ms @ 400V AC
800ms, 40ms, 40ms @ 500V AC full load

- Withstand voltage: I/P-O/P: 3KV AC, I/P-FG: 1.5KV AC, O/P-PG 0.5KV AC
- Working temperature: -20 to +70°C (-4 to +158°F) at 100%
- Safety standards: EN60950-1, UL508
- EMC standards: EN55022 (CISPR22), EN61000-4-2,3,4,5,6,8,11
ENV50204, EN61204-3
EN61000-6-2 (EN50082-2)
Heavy Industrial Level, criteria A
- Military Standard: MIL-HDBK-217F

* Except PSH-120xx (see data sheet at altechcorp.com)

240W Three Phase Industrial



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PST-24024	24V DC	10A	$\pm 1\%$	80 mVp-p	89%
PST-24048	48V DC	5A	$\pm 1\%$	80 mVp-p	89%

Three phase input: 340-550V AC wide range, 480-780V DC
0.95A @ 400V AC, 0.75A @ 500V AC
Connection: Input - 4 poles, Output - 4 poles screw terminal
Size (WxHxD): 125x125x100mm (4.95x4.95x3.95 inches)
Packaging: 1/box; 2.9lbs / 1.2Kg

480W Three Phase



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PST-48024	24V DC	20A	$\pm 1\%$	80 mVp-p	89%
PST-48048	48V DC	10A	$\pm 1\%$	80 mVp-p	90%

Three phase input: 340-550V AC wide range, 480-780V DC
1.7A @ 400V AC, 1.3A @ 500V AC
Connection: Input - 4 poles, Output - 4 poles screw terminal
Size (WxHxD): 227x125x100mm (9.95x4.95x3.95 inches)
Packaging: 1/box; 5.5lbs / 2.5Kg

960W Three Phase



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PST-96024	24V DC	40A	$\pm 1\%$	80 mVp-p	91%
PST-96048	48V DC	20A	$\pm 1\%$	80 mVp-p	92%

Three phase input: 340-550V AC wide range,
2A @ 400V AC, 1.6A @ 500V AC
Connection: Input - 4 poles, Output - 6 poles screw terminal
Size (WxHxD): 276x125x100mm (10.87x4.95x3.95 inches)
Packaging: 1/box; 7.3lbs / 3.3Kg

960W Three Phase Parallel Function (1+1)



Cat. No.	Output V DC	A	Tol. %	Ripple & Noise	Efficiency
PST-960P24	24V DC	40A	$\pm 1\%$	80 mVp-p	91%
PST-960P48	48V DC	20A	$\pm 1\%$	80 mVp-p	92%

Three phase input: 340-550V AC wide range,
2A @ 400V AC, 1.6A @ 500V AC
Connection: Input - 4 poles, Output - 6 poles screw terminal
Size (WxHxD): 276x125x100mm (10.87x4.95x3.95 inches)
Packaging: 1/box; 7.3lbs / 3.3Kg

Power Supply Accessories

Key Features

PS-RDN20 Key Features

- Suitable for redundant operation of 24V system
- Installed on 35 x 7.5 mm or 35 x 15 mm DIN Rail
- Relay contact signal output and LED indicator for input failure alarm
- Cooling by free air convection
- 3 years warranty

PS-UPS40 Key Features

- Battery controller for DIN Rail UPS system
- Installed on 35 x 7.5 mm or 35 x 15 mm DIN Rail
- Parallel connection to DC BUS
- Suitable for 24V system up to 40A
- Built-in battery test function
- Battery polarity protection
- Relay contact signal output and LED indicator for DC BUS OK, Battery Fail, and Battery Discharge
- Cooling by free air convection
- 3 years warranty

Power Supply Redundancy Buffer Module



PS-RDN20 is a 20A redundancy (decoupling) module for the 24V DC power system. Containing 2 sets of 20A Oring diodes with excellent heat dissipation deployment. PS-RDN20 give you a new option for safe connection of 1+1 redundant set-up. Not only perfectly decouple power sources from each other as well as from the load, PS-RDN20 also provides users monitoring signals for both input channels through the built-in relays. Since there's no switching components inside the module, PS-RDN20 will not arise additional EMI issues and should provide you a worry-free application platform!

40 AMP UPS Battery Controller



PS-UPS40 is a 40A max. DC UPS (battery control) module for the 24 V DC power system. Accompany with external batteries, it can back-up up to 40A of current to critical loads for certain period of time depending on the capacity of batteries. With complete monitoring signals and LED indicators for DC BUS OK, Battery Fail, Battery Discharge and the repeated Battery Test function to check the situation of external batteries. Users can customize their own DC UPS system to back up critical loads and capture the status of the whole system easily.

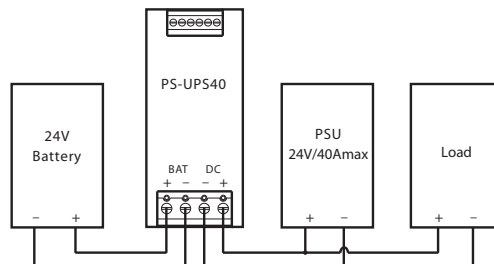
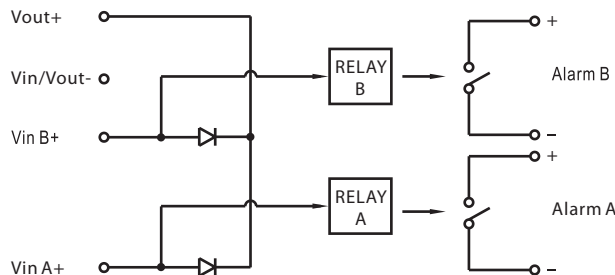
Cat. No.	Voltage Range	Current Range
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PS-RDN20 21-28V DC 0-20A
 Connection: Terminal 1 - 4 poles, Terminal 2 - 6 poles
 Size (WxHxD): 55.5x125x100mm (2.19x4.95x3.95 inches)
 Packaging: 1/box; 1.1lbs / 0.5Kg

Cat. No.	Voltage Range	Current Range
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PS-UPS40 21-29V (Battery)
 24-29V (DC) 0 - 40A
 Connection: Terminal 1 - 4 poles, Terminal 2 - 6 poles
 Size (WxHxD): 55.5x125x100mm (2.19x4.95x3.95 inches)
 Packaging: 1/box; 1.21lbs / 0.55Kg

DC Fail Block Diagram





Altech®
Printed Circuit Board
Terminal Blocks

Available in our
original AK and STL.
Plus our New Style.

Barrier Strip

Panel Feed-Through Blocks

The advertisement features a central collage of various green and black PCB terminal blocks. An inset in the top right shows a close-up of a block with multiple colored wires (red, black, green, yellow) plugged into it. Two smaller inset images at the bottom show a 'Barrier Strip' and 'Panel Feed-Through Blocks'.

Altech has a large variety of pluggable and fixed blocks in US and Metric Pin Spacing that are competitively priced and in stock for immediate delivery.

So the next time you need quality PCB terminal blocks
check out Altech!

MOUNTING TRACKS

For Printed Circuit Boards

DIN Rail or Panel Mount

Mount standard or custom printed circuit boards in Mounting Tracks which can be conveniently DIN rail or panel mounted in your control panel or cabinet. These are the same tracks used for Altech interface modules. We now make them available to you to house and protect your custom boards, etc. Tracks are easily cut to size or can be ordered precut to specific lengths. They are easily assembled from standard components and snap onto 35mm DIN rail or can be panel mounted.

Each track has two sets of printed circuit board guides to accept two alternate board widths.

End Sections hold printed circuit boards securely in place and keep out foreign objects.

MOUNTING

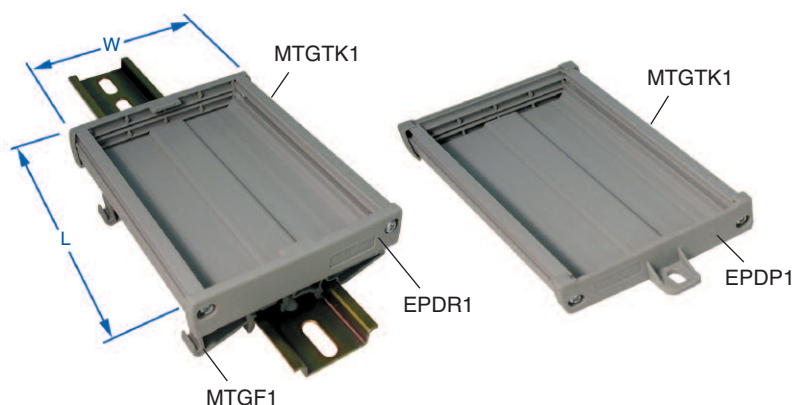
When mounting extrusions on DIN rail, order two or more MTGF1 DIN Rail mounting feet. These feet slide into grooves on the extrusion. Then attach two EPDR1 DIN Rail Mount End Sections with help of EPS screws.

To panel mount, order two EPDP1 Panel Mount End Sections (and EPS screws), each with an integral mounting flange with a 6 x 8mm (.24 x .32 in.) hole slot.

If desired, tracks can be direct mounted using double sided tape. Order two EPDR1 End Sections (and EPS screws).

- Standard Lengths: 1m (3'-3") or 2m (6'-6")
- Track Material: PVC
- Temperature Limit:
Short Term - 80°C (176°F)
Continuous - 70°C (158°F)
- End Section, Foot Material: Polyamide
- Preassembled, Precut Lengths Available
- Tracks Accept Standard MT2 Marking Tags

MTGTK1

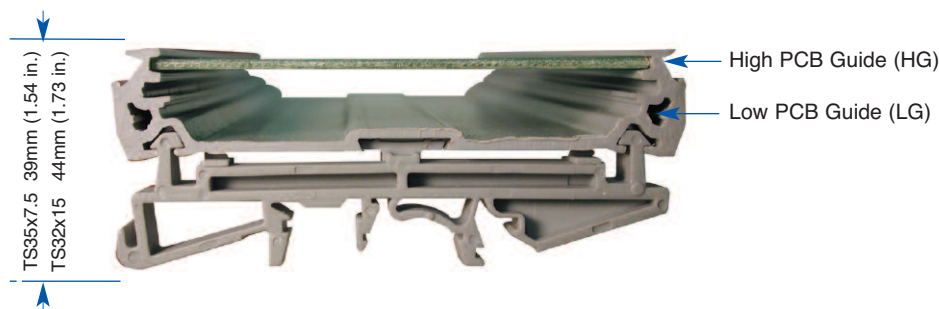


Narrow Mounting Track Extrusion and Components

For PC Board Widths
73mm (2.9 in.) or 69mm (2.7 in.)

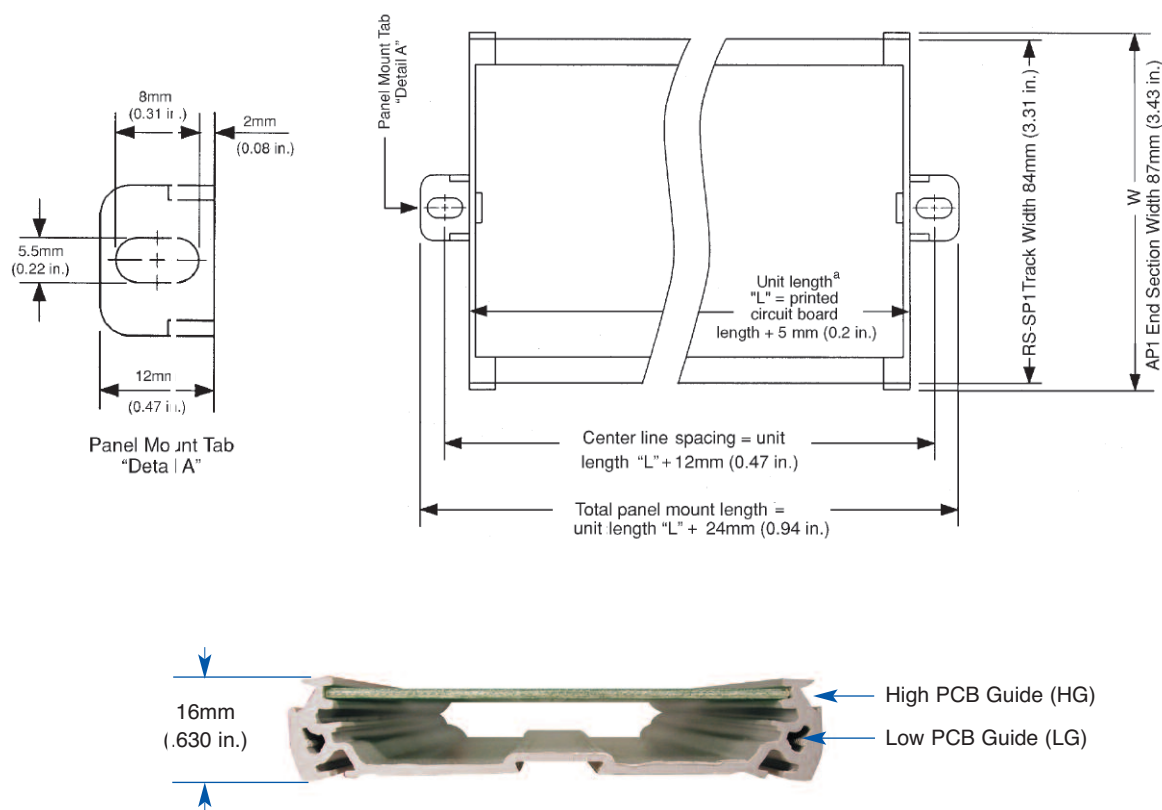
	Cat. No.	Std. Pk.
Mounting Track		
1 meter	MTGTK1/1M	25
2 meter	MTGTK1	25
Accessories		
DIN Rail Mount End Section	EPDR1	100
DIN Rail Mounting Foot	MTGF1	100
Panel Mount End Section	EPDP1	100
DIN Rail / Panel Mount End Section Screws #4x1/2", Phillips Pan head (2 required per end section)	EPS	200
Marking Tags	MT2	00
DIN Rail Mounting Kit (2x EPDR; 2x MTGF; 4x EPS)	1.100	1

DIN Rail Mount



Printed circuit board shown in High Guide

Panel Mount



Printed circuit board shown in High Guide

Sizing Information

Printed Circuit Board Width		
Track Type	High Guide (HG)	Low Guide (LG)
MTGTK1	73 ± 1mm (2.9 ± 0.04 in.)	69 ± 1mm (2.7 ± 0.04 in.)

Mounting Track Extrusion "Cut-to-Size" Formula
Extrusion Length = Printed Circuit Board Length – 4.5mm (.175 in.)

^aAlso applies for DIN Rail Mount Unit

INTERFACE MODULES INDEX

Part No.	Pg.	Part No.	Pg.	Part No.	Pg.
5492.2	.14	8905.2	.16	8941.6	.12
5492.5	.14	8905.3	.16	8942.2	.12
5494.2	.14	8906.2	.16	8942.3	.12
5494.5	.14	8906.3	.16	8942.5	.12
5502.2	.14	8907.2	.16	8942.6	.12
5502.5	.14	8907.3	.16	8943.2	.12
5506.2	.14	8908.2	.16	8943.3	.12
5506.5	.14	8908.3	.16	8943.5	.12
5508.2	.14	8909.2	.16	8943.6	.12
5508.5	.14	8909.3	.16	8944.2	.12
5514.2	.14	8910.2	.16	8944.5	.12
5514.3	.14	8910.3	.16	8945.5	.12
5514.5	.14	8911.2	.16	8946.2	.12
5514.6	.14	8911.3	.16	8946.5	.12
5700.2	.9	8912.2	.14	8948.2	.12
5701.2	.9	8912.3	.14	8948.5	.12
5702.2	.8	8912.5	.14	8949.2	.12
5702.3	.8	8912.6	.14	8949.3	.12
5703.2	.8	8913.3	.14	8949.6	.12
5703.3	.8	8913.6	.14	8951.2	.12
5704.2	.8	8914.2	.14	8951.3	.12
5705.2	.8	8914.5	.14	8951.5	.12
5706.2	.8	8921.2	.14	8951.6	.12
5707.2	.8	8921.5	.14	8953.2	.12
5712.2	.11	8923.2	.14	8953.3	.12
5714.2	.11	8923.3	.14	8953.5	.12
5720.2	.7	8923.5	.14	8953.6	.12
5721.2	.7	8923.6	.14	8954.2	.12
5722.2	.7	8924.2	.14	8954.3	.12
5723.2	.7	8924.4	.14	8954.5	.12
5724.2	.7	8924.5	.14	8954.6	.12
5725.2	.7	8924.6	.14	8955.2	.12
5726.2	.7	8925.2	.14	8955.3	.12
5727.2	.7	8925.3	.14	8955.5	.12
5728.2	.7	8925.5	.14	8955.6	.12
5729.2	.7	8925.6	.14	8956	.32
5730.2	.11	8926.2	.14	8956.2	.12
5731.2	.11	8926.3	.14	8956.3	.12
5732.2	.11	8926.5	.14	8956.5	.12
5733.2	.11	8926.6	.14	8956.6	.12
5734.2	.11	8927.2	.14	8957.2	.12
5735.2	.11	8927.3	.14	8957.3	.12
5736.2	.11	8927.5	.14	8957.5	.12
5737.2	.11	8927.6	.14	8957.6	.12
5746.2	.6	8928.2	.14	8959	.32
5747.2	.6	8928.3	.14	8959.2	.12
5748.2	.6	8928.5	.14	8959.3	.12
5749.2	.6	8928.6	.14	8959.5	.12
5750.2	.11	8929.2	.12	8959.6	.12
5751.2	.11	8929.3	.12	8963.2	.12
5752.2	.11	8929.5	.12	8963.5	.12
5753.2	.11	8929.6	.12	8971.2	.8
5800.2	.16	8931.2	.12	8971.3	.8
5800.3	.16	8931.3	.12	8972.2	.12
5801.2	.16	8931.5	.12	8972.5	.12
5801.3	.16	8931.6	.12	8973.2	.8
5802.2	.16	8932.2	.12	8973.3	.8
5802.3	.16	8932.5	.12	8974.2	.8
5803.2	.16	8933.2	.12	8974.3	.8
5803.3	.16	8933.3	.12	8975.2	.8
5804.2	.16	8933.5	.12	8975.3	.8
5804.3	.16	8933.6	.12	8995.2	.12
5805.2	.16	8935.2	.12	8995.5	.12
5805.3	.16	8935.3	.12	8999.2	.12
5806.2	.16	8935.5	.12	8999.5	.12
5806.3	.16	8935.6	.12	156.0A01.1222C	.20
8804.3	.10	8937.2	.10	156.0A01.1231C	.20
8835.2	.9	8938.2	.10	156.0A01.2422C	.20
8836.2	.9	8939.2	.10	156.0A01.2431C	.20
8837.2	.9	8940.2	.12	156.0A02.1224C	.22
8838.2	.9	8940.3	.12	156.0A02.1233C	.22
8839.2	.9	8940.5	.12	156.0A02.1242C	.22
8840.2	.9	8940.6	.12	156.0A02.2433C	.22
8842.2	.8	8941.2	.12	156.0A02.2442C	.22
8850.2	.8	8941.3	.12	156.0A11.1222C	.20
8861	.32	8941.5	.12	156.0A11.1231C	.20

Part No.	Pg.	Part No.	Pg.	Part No.	Pg.
156.0A11.2422C	.20	8926.3S	.18	PS-10024	.38
156.0A11.2431C	.20	8927.2C	.18	PS-12012	.39
156.0A12.1224C	.22	8927.2N	.18	PS-12024	.39
156.0A12.1233C	.22	8927.2S	.18	PS-12048	.39
156.0A12.1242C	.22	8927.3C	.18	PS-3005	.38
156.0A12.2424C	.22	8927.3N	.18	PS-3012	.38
156.0A12.2424C	.22	8927.3S	.18	PS-3015	.38
156.0A12.2433C	.22	8949.2C	.18	PS-3024	.38
156.0A12.2442C	.22	8949.2N	.18	PS-4505	.38
1SIP51212	.24	8949.2S	.18	PS-4512	.38
1SIP51224	.24	8949.3C	.18	PS-4515	.38
1SIR37212	.24	8949.3N	.18	PS-4524	.38
1SIR37224	.24	8949.3S	.18	_PS-6005	.38
1SIR73212	.24	8950 SERIES	.34	PS-6012	.38
1SIR73224	.24	8951.2C	.18	PS-6015	.38
1SIR82212	.24	8951.2N	.18	PS-6024	.38
1SIR82224	.24	8951.2S	.18	PS-7512	.39
1SIR91212	.24	8951.3C	.18	PS-7524	.39
1SIR92224	.24	8951.3N	.18	PS-7548	.39
256.0A01.1222C	.20	8951.3S	.18	PSH-12024	.39
256.0A01.1231C	.20	8954.0/B	.32	PSH-12048	.39
256.0A01.2422C	.20	8954.0/E	.32	PSP-24024	.39
256.0A01.2431C	.20	8954.0/G	.32	PSP-24048	.39
256.0A02.1224C	.22	8955.0/B	.32	PSP-48024	.40
256.0A02.1233C	.22	8955.0/E	.32	PSP-48048	.40
256.0A02.1242C	.22	8955.0/G	.32	PSP-480S24	.40
256.0A02.2433C	.22	8955.2C	.18	PSP-480S48	.40
256.0A02.2442C	.22	8955.2N	.18	PS-RDN20	.42
256.0A11.1222C	.20	8955.2S	.18	_PS-S10012	.37
256.0A11.1231C	.20	8955.3C	.18	PS-S10024	.37
256.0A11.2422C	.20	8955.3N	.18	PS-S10048	.37
256.0A11.2431C	.20	8955.3S	.18	PS-S2005	.37
256.0A12.1224C	.22	8956.0/B	.32	PS-S2012	.37
256.0A12.1233C	.22	8956.0/E	.32	PS-S2015	.37
256.0A12.1242C	.22	8956.0/G	.32	PS-S2024	.37
256.0A12.2424C	.22	8956.2C	.18	_PS-S4005	.37
256.0A12.2424C	.22	8956.2N	.18	PS-S4012	.37
256.0A12.2433C	.22	8956.2S	.18	PS-S4024	.37
256.0A12.2442C	.22	8956.3C	.18	PS-S4048	.37
456.0A01.1222C	.20	8956.3N	.18	_PS-S6005	.37
456.0A01.1231C	.20	8956.3S	.18	PS-S6012	.37
456.0A01.2422C	.20	8957.0/B	.32	PS-S6024	.37
456.0A01.2431C	.20	8957.0/E	.32	PS-S6048	.37
456.0A02.1224C	.22	8957.0/G	.32	PST-24024	.41
456.0A02.1233C	.22	8963.2C	.18	PST-24048	.41
456.0A02.1242C	.22	8963.2N	.18	PST-48024	.41
456.0A02.2433C	.22	8963.2S	.18	PST-48048	.41
456.0A02.2442C	.22	8972.2C	.18	PST-96024	.41
456.0A11.1222C	.20	8972.2N	.18	PST-96048	.41
456.0A11.1231C	.20	8972.2S	.18	PST-960P24	.41
456.0A11.2422C	.20	CL-1	.28	PST-960P48	.41
456.0A11.2431C	.20	CM-1/MS35	.28	PS-UPS40	.42
456.0A12.1224C	.22	DM-1	.28	RSM-110CU	.30
456.0A12.1233C	.22	EPDP1	.44	RSM-12CU	.30
456.0A12.1242C	.22	EPDR1	.44	RSM-220CU	.30
456.0A12.2424C	.22	EPS	.44	RSM-24CU	.30
456.0A12.2424C	.22	G08	.29	RSR-05DCS	.31
456.0A12.2433C	.22	G11	.29	RSR-06DCS	.31
456.0A12.2442C	.22	I1C-20BK	.27	RSR-12DCS	.31
8923.2C	.18	I1C-20BK	.30	RSR-24DCS	.31
8923.2N	.18	I1C-20BL	.27	RSR-48DCS	.31
8923.2S	.18	I1C-20BL	.30	RSR-60DCS	.31
8923.3C	.18	I1C-20RD	.27	RSS-110U	.30
8923.3N	.18	I1C-20RD	.30	RSS-220U	.30
8923.3S	.18	I1-L	.27	RSS-4860U	.30
8924.2C	.18	I1-OC	.27	RSS-624D	.30
8924.2N	.18	I1-T	.27	RSS-624U	.30
8924.2S	.18	L2	.28	VG-11T	.29
8924.4C	.18	M2	.28	VG-8T	.29
8924.4N	.18	M4	.28	VL-2	.28
8924.4S	.18	MT2	.44	VM-4T	.28
8926.2C	.18	MTGF1	.44		
8926.2N	.18	MTGTK/1M	.44		
8926.2S	.18	MTGTK1	.44		
8926.3C	.18	PS-10012	.38		
8926.3N	.18	PS-10015	.38		

Commonly used metric and other useful conversions

Length		
inch [in.]	x25.4	=millimeters
millimeters [mm]	x0.03937	=inches
meters [m]	x3.281	=feet
miles [mi]	x1.609	=kilometers
kilometers [km]	x0.6214	=miles
Torque		
Newtonmeter [Nm]	x0.738	=lb-ft
lb-ft	x1.356	=Nm
lb-in	x0.113	=Nm
oz-in	x0.0071	=Nm
Power		
kilowatt [kW]	x1.341	=hp
hp	x0.7457	=kW
Moment of Inertia (WR²)		
lb-ft ²	x0.042	=kgm ²
kilogrammeter ² [kgm ²]	23.720	=lb-ft ²
Weight Mass and Force		
Newton [N]	x0.02248	=pounds
kilogram [kg]	x2.205	=pounds
pound [lb]	x4.448	=N
pound [lb]	x0.4536	=kg

Metric Cross-Sectional Areas ¹		American Wire Gauge		Metric Cross-Sections Areas ^a		American Wire Gauge	
Cross-Sectional Area	Equivalent Metric Area	AWG or MCM		Cross-Sectional Area	Equivalent Metric Area	AWG or MCM	
mm ²	mm ²			mm ²	mm ²		
0.50	0.519	20	AWG	25.0	21.15	4	AWG
0.75	0.653	19		35.0	26.67	3	
	0.823	18			33.63	2	
					42.41	1	
1.5	1.04	17		50.0	53.48	1/0	
	1.31	16			67.43	2/0	
2.5	1.65	15		70.0	85.03	3/0	
	2.08	14		95.0			
	2.62	13			107.20	4/0	
4.0	3.31	12		120.0	126.64	250	MCM
	4.17	11		150.0	152.00	300	
	5.26	10		185.0	177.35	350	
6.0					202.71	400	
	6.63	9		240.0	253.35	500	
	8.37	8					
10.0				300.0			
	10.55	7		400.0	380.00	750	
	13.30	6					
16.0	16.77	5		500.0	506.71	1000	
				625.0			

^aAs per IEC Publ. 228

DEGREES CELCIUS VERSUS DEGREES FAHRENHEIT													
°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
-80	-112.0	-20	-4.0	5	41.0	30	86.0	55	131.0	80	176.0	105	221.0
-70	-94.0	-19	-2.2	6	42.8	31	87.8	56	132.8	81	177.8	106	222.8
-60	-65.0	-18	-0.4	7	44.6	32	89.6	57	134.6	82	179.6	107	224.6
-50	-58	-17	+1.4	8	46.4	33	91.4	58	136.4	83	181.4	108	226.4
-45	-49.1	-16	3.2	9	48.2	34	93.2	59	138.2	84	183.2	109	228.2
-40	-40.0	-15	5.0	10	50.0	35	95.0	60	140.0	85	185.0	110	230.0
-39	-38.2	-14	6.8	11	51.8	36	96.8	61	141.8	86	186.8	111	231.8
-38	-36.4	-13	8.6	12	53.6	37	98.6	62	143.6	87	188.6	112	233.6
-37	-34.6	-12	10.4	13	55.4	38	100.4	63	145.4	88	189.4	113	235.4
-36	32.8	-11	12.2	14	57.2	39	102.2	64	147.2	89	192.2	114	237.2
-35	-31.0	-10	14.0	15	59.0	40	104.0	65	149.0	90	194.0	115	239.0
-34	29.2	-9	15.8	16	60.8	41	105.8	66	150.8	91	195.8	116	240.8
-33	-27.4	-8	17.6	17	62.6	42	107.6	67	152.6	92	197.6	117	242.6
-32	-25.6	-7	19.4	18	64.4	43	109.4	68	154.4	93	199.4	118	244.4
-31	-23.8	-6	21.2	19	66.2	44	111.2	69	156.2	94	201.2	119	246.2
-30	-22.0	-5	23.0	20	68.0	45	113.0	70	158.0	95	203.0	120	248.0
-29	-22.0	-4	24.8	21	69.8	46	114.8	71	159.8	96	204.8	121	249.8
-28	-18.4	-3	26.6	22	71.6	47	116.8	72	161.6	97	206.6	122	251.6
-27	-16.6	-2	28.4	23	73.4	48	118.4	73	163.4	98	208.4	123	253.4
-26	-14.8	-1	30.2	24	75.2	49	120.2	74	165.2	99	210.2	124	255.2
-25	-13.0	0	32.0	25	77.0	50	122.0	75	167.0	100	212.0	125	257.0
-24	-11.2	1	33.8	26	78.8	51	123.8	76	168.8	101	213.8	126	258.8
-23	-9.4	2	35.6	27	80.6	52	125.6	77	170.6	102	215.6	127	260.6
-22	-7.6	3	37.4	28	82.4	53	127.4	78	172.4	103	217.4	128	262.4
-21	-5.8	4	39.2	29	84.2	54	129.2	79	174.2	104	219.2	129	264.2

Conversion Formula °F = 9/5°C + 32° °C = 5/9(°F-32°)

Custom Assemblies Available

- Most competitive in industry
- Made to your specifications
- Large inventory of components
- Variety of colors available
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- Custom Interface Assemblies
- Enclosure Customizaion
- Imprinting
- Foot Switch Customization
- New Product Development
- Other Value Added Services.